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SKETCH
OF THE
REVOLUTIONS
OF
MEDICAL SCIENCE,
AND
VIEWS
RELATING TO ITS
REFORM.

BY P. J. G. CABANIS,

MEMBER OF THE NATIONAL INSTITUTE OF FRANCE, OF THE MEDICAL
SOCIETY AND SCHOOL OF PARIS, OF THE AMERICAN
PHILOSOPHICAL SOCIETY OF PHILADELPHIA, &c. &c.

TRANSLATED FROM THE FRENCH,
WITH NOTES,
BY A. HENDERSON, M.D.

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1806.

SKETCH

OF THE

REVOLUTIONS

OF

MEDICAL SCIENCE

AND

ARTS

BY

ἸΠΠΟΚΡΑΤΗΣ ΓΑΡ ΦΙΛΟΣΟΦΟΣ ἼΣΟΘΕΟΣ.

HIPPOCRATES De decenti Ornatu.

BY R. J. G. CARR

REPRINTED FROM THE LONDON
EDITION OF THE MEDICAL
AND SURGICAL ARTS, BY THE
AMERICAN DOCTORS OF THE
FACULTY OF MEDICINE, NEW YORK.

TRANSLATED FROM THE GREEK

WITH NOTES

BY A. HENDERSON, M.D.

LONDON:

JOHN W. JOHNSON, ST. PAULS CHURCH-YARD, NEW YORK
AND ALBANY, AND NEW YORK AND ALBANY.

1852

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ERRATA.

- Page 6, line 23, *for* indispensable *read* indispenfable
74, — 23, *for* alfo studied *read* studied alfo
88, — 8, *dele the* comma *after* only
93, — 17, *for* latter *read* later
165, — 2, *dele* *for* *after* have
225, — 1, *for* them *read* Europe joined them
309, — 21, *for* affected *read* effected
399, — 15, *dele* us *after* obliges

ADVERTISEMENT.

THE original of the following pages was published at Paris about two years ago. The known abilities of the Author, the merits of the present performance, and the conviction that such a work had been long wanted in Medical and Philosophical Literature, induced me to attempt its translation.—In executing my task, I have studied to preserve faithfully the sense of the Author. I have, however, ventured to correct a few mistakes, (relating chiefly to names and titles) into which he had fallen; and in the Notes subjoined at the end of the volume, I have controverted certain positions in the text, which seemed to admit of doubt, and illustrated others, which appeared to require explanation.

A. H.

LONDON,
Sept. 12, 1806.

PREFACE OF THE AUTHOR.

THE present work was composed during the winter of 1794-5. Garat, at present Member of the Senate, was at that time Commissioner of Public Instruction. Connected with him by ties of friendship, which time, our tastes, our studies, our common wishes for the progress of knowledge and the increase of the happiness of mankind, had been constantly strengthening and confirming, I felt particularly interested in the execution of the comprehensive plan which he had formed for the improvement of all the branches of education. He judged that I might assist him in his undertaking. Some views which I had communicated to him, respecting the application of Analytical Methods to the study of Medicine, appeared to him both just and useful. In consequence of his pressing entreaties, I was induced to put them into some kind of order: and it then was my intention to have published them without delay.

But

But, as it generally happens, when we take the trouble to consider any subject in all its different lights, in proportion as I collected my ideas and attempted to digest them, I found the work swell under my hands, and the subject acquired, in my mind, greater extent and importance. I ventured to conceive the plan of reducing all the branches of medical science to very simple elements, by indicating, in each branch, the method which appeared the best calculated to guide, with certainty, its study and system of instruction.

An undertaking of so great a magnitude, which was designed to exhibit the science in entirely new points of view, rendered several preliminary considerations necessary: it was intended to have been preceded by an introduction, in which I thought it might be useful to give a rapid sketch of the different revolutions of medicine, and to describe, in a summary manner, the general principles which should direct its reform.

This introduction is the only part which I have been able to finish. Till the present moment, I was unwilling to publish it, in the hope of one day

day accomplishing my original design. But the declining state of my health prevents me from indulging any longer this hope, which, perhaps, it was presumptuous in me ever to have entertained. I have, therefore, yielded to the solicitations of some of my friends, in submitting this imperfect sketch to the public. I certainly should have desired to render it more worthy of their acceptance: but the same reason which induces me to commit my work to the press, has deprived me of the courage and the means of perfecting it. Such as it is, it will be found, I believe, to contain some useful ideas: and this belief has been sufficient to overcome my scruples with respect to its publication, which, perhaps, would have prompted me to consign it to oblivion. If our young students, for whose use it is particularly destined, should derive any benefit from its perusal, the satisfaction of having assisted them in their labours will amply reward me for my trouble.

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SKETCH
OF THE
REVOLUTIONS
OF
MEDICAL SCIENCE, &c.

DESIGN OF THE WORK.

IN proportion as the boundaries of the Sciences are extended, it becomes more requisite to improve the methods of arrangement and instruction. To the sciences of observation this remark is peculiarly applicable. The mind soon finds itself lost in the multiplicity of the facts which have been collected, if the genius of philosophy does not arrange them in a proper order, whence may issue, as it were, spontaneously, the general principles belonging to each particular branch of research. When these principles have been legitimately deduced from the comparison and examination of all the facts combined, the system, or general doctrine, resulting from them, is no longer a vague hypothesis; but forms a true picture of the science, at least, in as far as the state of its progress

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progress will permit it to be traced : and the new discoveries, that may be made, will be easily referred to the general principles, to which they relate ; whether they tend to confirm them, or to contradict them, and to render some changes or modifications of them necessary.

According to this last supposition, that is, when the new discoveries overturn certain conclusions, which all the facts formerly known had caused to be regarded as general truths, it may be easily perceived, that the classification of the same facts, and the expression or connection of the principles, which must always be directly deduced from them, will demand more or less important corrections. Every period, which is distinguished by the marked advances of any science, must be equally characterized by analogous reforms in the language, and in the elements of that science. The human mind, in order to obtain a ready command, and facility in the application of its acquirements, must possess a common principle that combines them, arranges them, and forms a complete whole of the parts, which in themselves are insignificant, as long as they remain scattered and undigested. Each of these epochs will ascribe to itself the exclusive possession of the truth ; and all of them may have an equal claim to it, if the systems which they have produced embrace and connect, in a natural manner, all the known facts ;

facts; for general truths are, and can be only conclusions from all the observations, or from all the particular ideas, which have been collected on any given subject.

There are, however, discoveries, which shake the very foundations of a science, and which, in a manner, change its whole appearance. How then is it possible that its system of arrangement, and its method of instruction, should not undergo a similar reform?

But, even, when the new facts which are observed, or the new ideas which are acquired, naturally find their place in the arrangements formerly adopted, the gradually increasing number of those facts and ideas obliges us, from time to time, to revise and simplify the classifications, which comprise them, and the methods, which have been resorted to in order to facilitate their study. In this way, science may be compared to an inquisitive traveller, who, collecting every thing which interests him on his journey, sees his baggage increase in bulk every moment, and feels himself frequently obliged to stop and examine it, in order to free himself from the useless and redundant articles, or to arrange, in a more suitable order, those which he cannot dispense with, that they may occupy less room, and that the carriage or the employment of them may become more easy and convenient.

If there be a science overcharged, if I may be allowed the expression, with superfluous baggage, it is doubtless medicine; and none stands more in need of a true philosophical spirit to direct its reform. A rigorous method, which would free it from all useless and extraneous matter, is required for simplifying, by an improved arrangement, the system of necessary knowledge of which it is composed, and for throwing a new light on the true relations which it bears to several other sciences. The objects of its attention are so numerous; the qualities of mind required for its cultivation are so various, and even, in appearance, so opposite; the practice of the art is so full of difficulties; the chief object which it has in view, is one of so very high importance; that a complete reform, similar to that which was formerly effected by Hippocrates, is required for promoting its progress, the improvement of its plan of instruction, and its application to useful purposes. The interests of humanity, as well as those of the science itself, plead for it.

At a time when all the branches of science are in some measure renovated, those physicians who are endowed with any portion of philosophy, should regard it as a duty to unite their efforts, in order to accomplish this great reform of their science and their art. The enlightened state of the age will allow it to be more complete, and

more

more permanent in its effects, than even Hippocrates could have rendered it in his time. Considering the rapid and progressive impulse which has been communicated to all the branches of human knowledge, it would not be sufficient to execute merely the reforms which are required at the present moment; but we should pave the way for those that may become necessary afterwards; for all ought to be directed by the same spirit, if not executed on the same plan. Witnesses of the daily advances which are made in the other departments of natural philosophy, to which men of genius have applied the true methods of research, physicians surely would not be excusable, if they allowed the beautiful and extensive science which they cultivate, to remain buried under that crude and undigested mass of materials, which observers have so often collected without discernment, and which theorists have so often employed without judgement or discrimination. Surrounded, as they are, by objects so various, so fugitive, so delicate, and in the examination of which the least aberrations of reasoning or deduction lead to the most dangerous errors; they certainly will not be permitted to tolerate a vague and inaccurate language, capable of obscuring the most simple truths, and of giving to the mere fictions of the imagination all the appearances of reality.—The time is come for placing medicine on a level with the

other sciences, and for determining, with precision, their mutual relations. Situated between physics and moral philosophy, it is of peculiar importance to discover, and to point out, with clearness and exactness, the true relations which it bears to each of these sciences. It must borrow the strict and precise language of the former, and the liberal, and as it were familiar, tone of the latter. It must take advantage of all that the intellectual philosophy has most rigorously established in its theories, and of all the delicate illustrations which its daily application to the sensitive frame suggests. In short, after having, by the sure methods of observation, experiment, and reasoning, reduced its principles to a regular system, it will be necessary, that the improvements in its plan of instruction should form for practice a set of minds, at once profound, comprehensive, firm, and pliant, who join to the light of a superior understanding that knowledge of life and manners, and that facility of action, without which all the gifts of nature and of art are almost wholly useless. Happy combination, perhaps even indispensable, for preventing the practice of a science, of which the objects are so various and so delicate, from becoming a mere scourge of humanity!

Influenced by these powerful considerations, I had ventured to conceive the plan of a new classification of the different branches of medical research,

research. I judged it advisable to adopt a new arrangement of the facts on which it rests, and of the particular ideas or opinions which their careful examination suggests; and without presuming to change its phraseology or its nomenclature, I hoped to be able, by rigorously determining the meaning of the words I employed, to banish entirely from its language, that vagueness and that obscurity, which so very much disfigure it. This appeared to me a duty so much the more indispensable, that these defects may mislead even the most enlightened inquirers; and, above all, by furnishing the ignorant quack with an almost inaccessible asylum, they become, first, the source of the most fatal errors, and, afterwards, sanction them by a sort of mysterious attraction. As I proposed to consider the science of medicine, more particularly as it relates to the treatment of diseases, it was to that branch of it which bears the name of *Therapeutics*, that all the others were to have been subordinate; it was in relation to it that all their subdivisions were to have been traced, and all their mutual connections determined; and the conclusions, resulting from this new method of regarding things, were all to have had the common aim of improving the practice of the art.

Different avocations and duties, however, have not allowed me to accomplish so great an undertaking, which, besides, is, in all probability, above

my powers. The following work, which was designed for an introduction to it, is the only part of it which has been completed; it is, at least, the only part which I can at present venture to offer to our young students, to whom I sincerely hope it may not prove wholly useless.

The direct object, then, of this work is to trace, in a rapid and summary manner, the history of the revolutions of medical science; to distinguish each revolution by the circumstances which have occasioned it, and by the changes which it has effected in the state, or in the progress, of the science; and lastly, to endeavour to discover, if these different views, when subjected to modern philosophical methods, may not suggest some useful hints for the reform of the science, and of its plan of instruction.

In order to arrive at all the causes of the different changes which medicine has undergone, and to describe them with exactness, it would be necessary to enter into all the details of its history; it would be necessary to join with it the history of many other collateral sciences; it would be necessary even to trace in some degree that of civilized society. Indeed it is only, perhaps, by viewing these different objects together; by examining the reciprocal action of the social state and of political events upon each other, their common influence on the progress of the human mind in general, and that of the different

ferent sciences on medicine, in particular, that we can form a precise and perfect idea of the state of the latter, in all its stages of advancement, down to the present time. Nothing, certainly, would be more philosophical, than its history executed on such a plan, and with such views: it would reflect a new and clear light upon many parts of the general history of mankind, with which, at first sight, the science of medicine seems to have no connexion. But our object does not prescribe to us so vast a plan. It will suffice for our purpose, to characterize distinctly the principal epochs of medical history; to point out, in each revolution, the real state of public opinion; to appreciate, with accuracy, causes and effects; and lastly, to inquire, what are the proper means of promoting the reform which has been for some time preparing, and which, eventually, cannot fail of accomplishment.

Such, then, is the design of the following work,

CHAPTER I.

SECTION I.

Is the Art of Medicine founded on a solid basis?

BEFORE we enter upon our subject, some preliminary considerations are necessary. — Many philosophers of reputation have regarded medicine as a deceitful art, the empire of which was founded solely on credulity and weakness. The secret springs of the human frame are, they say, too delicate for us to flatter ourselves, that we ever can precisely ascertain the causes of their derangement. Nature has placed in her work the means of restoring order; and whenever these means are insufficient in themselves, the pretended resources of medicine are wholly useless.

Even some very enlightened physicians have countenanced this opinion; at least, they limit the power of the art to such a degree, as to regard the study of it rather as an object of curiosity, than of utility. The knowledge of man, in a state of health and disease, forms, in their eyes, but a branch of natural history, interesting no doubt in itself, but scarcely applicable to the preservation of human life.

According

According to either of these ways of considering the medical art, it would deserve but little attention on the part of the government. If it be viewed in the former light, it would only, like other sorts of imposture, require the superintendence of a strict and vigilant police; if it be placed in the latter point of view, we should lose no time in subjecting it to the most scrupulous examination, in order to select the small portion of useful knowledge which it contains, and to consign the rest to contempt and oblivion.

In another work I have discussed this question of the certainty of medicine. I have stated, at full length, the different arguments upon both sides, and I flatter myself, that I have succeeded in removing the doubts and difficulties, which must have suggested themselves to every reflecting mind. I shall, in this place, mention briefly the conclusions which have resulted from that inquiry.

The study of nature is, in general, a study of facts, and not of causes. We observe merely a series of phenomena and sensible changes, frequently without having the means of discovering how these phenomena take place, or how these changes are effected.—For studying the phenomena, which living bodies exhibit to our view, and for tracing their history with accuracy, it is not necessary that we know the nature of the principle that animates them,

or

or the manner in which it brings their powers into action. It is sufficient for our purpose, to ascertain the existence of the phenomena themselves, to mark the order in which they are produced, as well as the mutual relations which they bear to one another, and to class them in such a manner, that both this order and these mutual relations may be distinctly perceived. For studying the healthy and diseased states, for tracing the progress and developement of any particular disease, we have no occasion to know the essence of life, or that of the morbid cause. Observation, experience, and reasoning are sufficient for our purpose—We require nothing more.

As, during health, a series of regular actions are performed, for supporting, and, in some measure, for renewing it every moment; so, according to the laws of organization, the state of disease is accompanied by another series of actions, which seem destined to undermine it; but which, in reality, when they are neither too weak, nor too violent, nor diverted from their proper end, by new disorders, tend, for the most part, to reestablish the natural health and order of the system.

These movements are manifested by phenomena peculiar to themselves, which, to attentive observers, characterize them sufficiently. Such are the ejection of substances which disorder the stomach,

mach, frequent alvine discharges, copious diureses, hemorrhages, perspirations, &c.

Sometimes, the changes which take place in the animal economy are more obscure and concealed; their external signs are less evident; and their nature is no longer the same. Thus, the aversion to some particular substances, or uncommon appetites for others, transient exaltations or depressions of different vital functions, certain changes in the system subjected to a periodical revolution, or returning at undetermined times, are at once the signs of internal disorders in the body, and the instruments by which nature effects their cure. It only requires some attention to perceive these different phenomena, and to discover in what cases these spontaneous efforts are useful or injurious.

From observation also we learn, what general combination of symptoms distinguishes the diseases, in which it is prejudicial to the patient, or favourable to his cure, to follow the suggestions of instinct, and to direct our operations accordingly.

But certain substances applied to living bodies occasion the same actions, and produce the same phenomena. Taken internally, some purge or provoke vomiting; others promote perspiration, or occasion an increased flow of urine, or excite or diminish the vital actions; while others, again,

moderate

moderate excessive pain, and induce sleep, the return of which is so necessary for the preservation of health; or, by a specific power, they suspend or suppress entirely certain actions in the system. Finally, there are some, which, acting in a more tardy manner, alter the state of the fluids, and the nature and properties of the solids.

Sometimes, by stimulating the extremities, we may excite a direct and general action in the whole system, sufficient to change entirely its condition: at other times, these powerful local impressions connect the disordered movements, give a new direction to them, or even establish others of a totally different nature. Again, they may sometimes produce various evacuations of the fluids, the effects of which will be determined by the character of the disease, and by the circumstances in which these new actions originate.

Lastly, the presence of the external air is, in general, necessary for the support of life: its presence is even indispensable to the existence of man, from the very moment of his birth. Now, this fluid is found in various states, and consequently produces on our bodies very different effects. Food and drink are equally necessary, both for exciting and supporting the action of the animal machine, and for repairing its daily losses. Now, the operation of these substances, when introduced into the digestive organs, into the circulation of the fluids,
and

and penetrating into the minute contexture of the fibres, necessarily becomes the cause of numerous changes, which extend their influence over the whole living system.

We may further observe, that the atmospherical air is different, in different parts of the globe. The nature of the soil, its cultivation, and the manner in which it receives the solar light, the vicinity of running or stagnant waters, of woods or mountains, may intirely alter the properties of the atmosphere. Of these properties, some are sensible, and in some measure external, as cold and heat, dryness and humidity. Others, again, are manifested only by their effects.

The skilful observer may, even on these points, ascertain, by sure methods, the nature of all the objects of his researches. He may estimate, with precision, the effects of different remedies, and trace to himself rules, which will reduce the probability of their success to a high degree of certainty; by classing methodically both the cases in which they have been given, with all their minute distinctions, and the remedies themselves, according to their different combinations. He may determine the action of the atmospherical air in different situations, and estimate the influence of different sorts of food, according to their nature and apparent qualities. In short, all the effects of regimen, in the most extensive sense of the word, may

may be directly appreciated; for the states of sleeping and waking, an active or sedentary life, fatigue of body or mind, the mode of clothing and lodging, the affections of the imagination, and the various emotions of the mind, may all be said to contribute to the preservation of health, or to become the cause of new disorders in the living system.

To conclude, the ancient physicians have left us extensive catalogues of diseases, which have been enlarged by their successors; and unfortunately, in these latter ages, several new disorders have invaded mankind. Amidst all the physical maladies, which the developement (too often misunderstood) of our moral nature may still continue to augment and to aggravate, there are many, which, when left to the precarious succours of nature, prove almost always fatal; but which art has frequently found means to cure.

This general observation is proved by the method of treatment, which has been invented for the cure of dropries arising from inveterate obstructions, for the cure of scurvy, of the venereal disease, and, in particular, of malignant intermittent fevers. It would be easy to confirm this assertion by the history of some particular, but less important, methods of cure of different acute or chronic diseases; but I purposely avoid all minute detail, and shall therefore conclude my remarks on this subject.

We see, then, that medicine, like other arts, is really founded on observation and induction. Having the alleviation of one of our chief wants in view, it is, even at the present moment, of the most direct and extensive utility, and may every day become more and more so. And if, in all ages of the world, we have seen this utility called in question by men of sense and discernment, we must ascribe it solely to the errors of its language, the vagueness of its theories, and the unphilosophical character of the great majority of its books and plans of instruction. Surely, then, the art of medicine merits the most serious attention on the part of a philanthropical legislature; and its place, in every plan of national education, should be worthy of the importance of its object.

We may, indeed, be told, that, if the art exists in nature, or if nature has placed within our reach the objects to which it is directed, and we have really received from her the means of studying and explaining them, the mere difficulty of its application is sufficient to render it nugatory, or dangerous, in practice. To this opinion I can by no means assent. But, even, if the assertion were well founded, it should serve as an additional motive, to incite us to improve the methods of observation and experiment which are applicable to medical research, to promote the reform of its plan of instruction, and to watch, with care, over all its labours.

SECTION II.

Different points of view, in which the Art of Medicine may be considered.

IN order, however, to form a just idea of the art of medicine, it is not sufficient to view it simply with reference to the individuals whose health it may preserve, or to the complaints which it may cure or alleviate. This general result of its application forms, no doubt, its principal object; but may it not, with justice, be said to possess the most beneficent attribute of nature—that of restoring to life the feeble mortal who is rapidly sinking into his grave; and to present a living picture of those superior beings, whom the imagination figures to itself as bearing upon earth the propitious commands of the Divinity? A family in tears, or an assemblage of friends, seized with the most heart-rending anguish, call upon you to give them back the object of their attachment. You fulfil their wishes, and you become, in their eyes, a friendly deity! And when you restore the happiness of two beings, who live in each other's affections, but who are on the point of separating for ever, you not only rekindle the flame of life in the one whom your cares revive, but you bestow, as it were, a double blessing. In short, you seem, in some measure, to do more than the power which called us
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from

from nothing into life.—To preserve to our country its most useful citizens, to prolong the services of genius and the example of virtue, are surely the most noble and most praiseworthy actions, that can deck the annals of the human race.

There are, I repeat, several other respects, in which medicine may prove of essential importance and utility to society, either by the direct influence which it exerts on a variety of objects of daily use, or by the information and assistance which it affords in the other branches of science.

1. The study of the animal economy forms an important branch of natural history, or, rather, of general physics; and the animal economy itself cannot be well understood, but by the most accurate observation of the healthy and diseased states of the system, and by the most attentive examination, both of the phenomena, which result spontaneously from the action of the living powers, and of the phenomena, which are produced by the agency of external objects, or by the exhibition of certain substances internally.

In the study of nature, we can neither separate those objects which are united by fixed relations, nor divide those which form a simple whole. Now, physical science embraces the consideration of the animal system, which, from the simple reason that it interests us so immediately, holds the first place in it; and the bare description of this sys-

tem, if we confined our views to a delineation of it in its healthy state, would necessarily require an intimate acquaintance with diseases; because these latter give birth to many phenomena which it would be very difficult to appreciate without such assistance, and disclose several springs of action, or properties of the body, which are obscured and concealed in the uniformity of a more regular and settled state.

2. The general science of human nature is divided into two principal branches: into its physical, and into its moral history. From their systematic union, and from the indication of the numerous points in which they are related and connected with each other, results what may be called the *Science of Man*, or the *Anthropology* of the Germans. In fact, whether the object of medicine be to determine the rules of regimen, and from the observation of diseases, to deduce a series of principles applicable to their treatment; whether the moralist strive to promote the happiness of private life, by tracing particular maxims of conduct, or the legislator endeavour to increase the prosperity of the state committed to his charge; whether, in fine, the artist and philosopher be desirous to direct our views to new objects of importance, and to prepare for us new sources of enjoyment;—it is always, with the portrait of man in their hands, if we may say so, that they ought

ought to proceed: and as his physical description forms the ground-work of the design, the science of medicine, which illustrates and completes the representation, is more or less intimately connected with all the other parts, and, in particular, serves to throw the necessary light on the basis of all the moral sciences.

3. Man, from the nature of his organization, is endowed with a principle of progressive improvement, to which it is impossible to assign any bounds*. If we trace his advancement from the state of weakness and helplessness in which he is placed by nature upon this globe, to the acquirement of the first and even of the most imperfect association, what an immense interval does there not appear to exist! How many fruitless attempts, how many repeated efforts must he not have made to overcome it!

From that state of social infancy, or, to use more determinate and less arbitrary terms, from those savage communities which the remote annals of the world and several modern voyages describe to us, to the point at which the civilized nations of Europe are now arrived, the progress does not

* This principle of progressive improvement has, no doubt, its limits, like all the other powers of nature; but these limits cannot be fixed, and, we have every reason to think, will always remain undetermined.

seem more astonishing. Certain physical or political catastrophes have, it must be confessed, appeared to produce a retrograde march of the human mind. The Greeks and Romans, who accomplished such feats under the influence of liberty, have sunk into slavery, under the yoke of despotism and superstition. But one consolatory truth results from a judicious perusal of history,—that human affairs constantly tend to amelioration; that this progress is never inverted, nor even suspended, without the intervention of accidental causes that have power sufficient to derange this natural tendency; and that, as soon as these causes cease to operate, the progress towards perfection is resumed with increased energy and activity.

All that the labours of past ages have hitherto effected, is doubtless nothing in comparison of what remains for us to accomplish, and of what we shall leave to be done by succeeding generations. But a vast career of improvement has been lately opened before us, and we must render to posterity a faithful account of the use we make of the present opportunities, the most fortunate, perhaps, which mankind ever enjoyed.

Man is susceptible of improvement in two modes. His physical education and regimen, in the most enlarged sense of these words, serve to develop the action of his different organs, rouse his dormant faculties, and, in some measure, create

new

new sensitive powers. And when these means have been employed for several successive generations, it is no longer, *cæteris paribus*, the same men, or the same race of men that exist.

The moral education of man has for its object, to develop his understanding, to cultivate his affections, and to direct all his natural appetites, in the way that tends most effectually to promote his own happiness, and that of his fellow creatures. Every one is acquainted with the difference which it may create between one man and another, whose original dispositions were the same. When supported by all the influence of the legislature, it gives birth to those grand political phenomena, which the page of history holds up to our admiration, and which have occurred, in former ages, at intervals unfortunately too distant and too transient to produce much real and permanent good. Perfected itself, by the duration of its effects, and perpetuated with all its successive improvements, by a sort of transmission from father to son, the term of its advancement cannot be ascertained with precision; but is, in all probability, much more remote than is generally imagined.

It is by the combination of these two powerful principles, that human nature is rendered susceptible of a high degree of improvement. When skilfully united, they aid and assist each other. The causes which improve the physical constitution

of man, furnish, in some measure, the ground work, or instruments of his education; the circumstances which improve his moral nature, put these instruments into action, endow them with energy, and turn, into proper channels, the faculties which are most liable to receive a vicious direction.

The former of these causes is entirely within the sphere of medicine. We have already seen the direct, but very numerous relations which it bears to the latter.

The art of medicine, therefore, may exert a great and material influence on the progressive improvement of the human race.

4. Health is, no doubt, the natural state of man. But disease exists also in nature, since it results from the laws of nature, and, even in a great measure, from those which are established for the preservation of health. The exquisite sensibility of the organs of the human body; the predisposition to disease, which their growth at different periods occasions; the action of external causes, which we have it so seldom in our power to regulate; the inevitable accidents which happen in the ordinary course of life; and lastly, the indiscretions, of which even the wisest persons are sometimes guilty, all conspire to render man weak, sickly, and diseased, just as naturally, as he is healthy, cheerful, and vigorous.

But

But, when man suffers from disease, a warning voice, which no subtilty of reasoning can suppress, leads him to seek for relief. He ascribes his complaint to certain causes: he seeks a remedy for it, in the application of certain substances, or of certain impressions, which he regards as causes capable of acting in a different manner, and of producing different or opposite effects. Thus, he lays hold of the first link of a chain of observations, and it is thus he becomes physician and surgeon.

The state of debility, which results from disease, extends itself to the intellectual organs, in the same way as to the other animal functions. Disease depresses the powers of the understanding, as well as the vigour of the muscular system, and may deprave the judgment, as well as the digestion. A sick person becomes, in particular, extremely credulous about the object of his hopes and fears. Whoever promises him health may easily obtain his confidence, and he soon becomes the dupe of quacks and ignorant pretenders. Would it not be much more for his interest, if he were placed in the hands of a skilful physician?

With regard to all subjects, on which every man is competent to judge for himself, and which, from their very nature, render error unpardonable, or, at least, not very dangerous to the persons deceived, the legislature should grant a perfect liberty of thinking

thinking and of acting. It is even its duty to encourage all sorts of industry, and to allow full scope for all friendly offices. Mutual interest, whether real or imaginary, should be the sole regulator of society, for it is the only just one.

But when the subjects are of such a nature, that they cannot be maturely appreciated by individuals, and, at the same time, when errors of judgment may be productive of dangerous consequences to the latter; when daily and urgent want compels them to make a choice, and to make that choice often on the impulse of the moment; and when craft and imposture are equally encouraged to spread their snares, both by the prospect of success, and by the facility of obtaining it;—the legislature ought no longer to remain an indifferent spectator: but it becomes its duty to watch the designs of those who may be inclined to impose upon the credulity of others; it is bound to provide for the latter those general securities which preserve it, as far as possible, from deception; and it is even bound, in certain circumstances, to furnish it with particular advice and assistance. But there is no sort of traffic which opens a more ample field for quackery, than the practice of the different branches of medicine. There is no motive, which so powerfully disposes the mind to the grossest and most absurd credulity, as the desire of preserving, and, above all, the desire of recovering health.

Will

Will the legislature, then, leave the people without any safeguard, to fall a prey to their own weakness, and to the arrogance of quacks?

This consideration alone would render the establishment of medical seminaries indisputably requisite. Since man, in a state of disease, will always have recourse to medicines, it is surely more fit that these medicines should be administered by skilful hands; and since there will always be physicians, those who have been trained by skilful masters, are surely preferable to those whom chance has formed. To conclude; is it not the duty of every wise and benevolent government, to suppress and destroy that swarm of pernicious impostors, who ravage our cities and our plains, and who devour the bread of the artisan and peasant?

5. There are many kinds of victuals and articles of luxury, of which the quality should be legally attested, and the sale superintended by the police. Several substances, very dangerous in themselves, are accommodated to our use by processes of art. The most useful remedies may be easily deteriorated or adulterated, and, even in their most pure state, they should not always be permitted to be sold without certain precautions. It is clear, that, in all these cases, the light which medicine is capable of affording, can alone direct the measures of government.

Great

Great epidemical disorders have often been occasioned by changes in the common diet of the people. Animal food, for example, when corrupted by various accidental causes, or obtained from subjects, which have themselves died of certain disorders; fish, when either caught at particular seasons, when they are unwholesome, or spoiled, by an incipient state of putrescence, or in consequence of the methods that have been employed for preserving them; lastly, corn and flour, when injured by diseases of the plant, by want of proper care in the preparation, or by improper mixtures, have all frequently given birth to the most fatal contagious distempers.

Besides, the social state necessarily gives rise and occasion to several employments, which can only be executed under the inspection of persons conversant with the animal economy.—The purification (*assainissement*) of great cities and harbours; the construction and superintendence of places of public resort, in which a number of persons are crowded together; the draining of lakes, and marshes; the direction of canals, and the establishment of aqueducts and common sewers, do not, perhaps, less require the assistance of enlightened physicians, than of able architects and engineers. It is possible, sometimes, to stop the progress of a contagious disease, either by ordering the people to adopt cer-
tain

tain precautions, or by cutting off all communication with the infected place, by means of an armed force, or by opposing natural obstacles to the progress of the elements that are charged with the contagious principle.

It is well known, that an enlightened police affords the most powerful and effectual assistance in the time of the plague. Acron, in Sicily, and Hippocrates, in the Peloponnesus, are said to have stopped those with which Agrigentum and Athens were threatened*, by blocking up certain passages in the mountains, through which the pestilential effluvia were wafted by the winds, upon both those cities†.

6. Among the circumstances on which the public welfare depends, the preservation of useful animals, and the improvement of their breed, will always appear of essential importance to a

* The plague, as it exists at present, in the Levant, and as it has formerly prevailed at Marseilles, Toulon, London, Moscow, &c. is never propagated but by immediate communication with, or at least by close vicinity to the sphere of infection. But the ancients comprehended, under the name of the plague, all those epidemic disorders in which the fever is accompanied with affections of the glands and carbuncles. Many of these epidemics are, in fact, caused by the state of the atmosphere, or by the miasmata which it transports from a distance.

† See Note [A].

wife administration. The ox, the horse, the ass, and the mule, all share in our toils, and supplant or economize our manual labour. Their strength being so much more considerable and productive, the more vigorous and healthy that they are, augments, in a relative proportion, the produce of their labour, and diminishes the expence of their employment. From the skins of many species of animals man forms his most useful and convenient clothing, or he fashions them a thousand ways, to ornament his dwelling or his household furniture: and the flesh of some kinds furnishes him with a principal part of his food.

Notwithstanding the opinion of some philosophers, there can be no doubt, that animal food is very suitable to the human constitution; but it is certainly less proper, when the animals which afford it are weak and poor, and it becomes unwholesome or dangerous, when they are unhealthy or diseased.

To conclude; many species of animals render us particular services, and these surely may claim our attention to the means of improving them, of preserving them in a state of vigour and health, and of rearing them, according to those views and methods which render them more fit to supply our wants.

This

This branch of rural economy is wholly subordinate to the veterinary art. Now, the veterinary art itself is only a branch of medicine; and the numerous points in which it touches upon the treatment of the human body, will become more distinct and striking, in proportion as our knowledge of both is extended.

Such is the view that presents itself to the observer, when he regards this subject with a little attention; such are the different points which it appears to me necessary to consider, if we be desirous to form a sound judgment on the subject, to investigate it thoroughly, and, especially, to deduce from the investigation, useful, and generally applicable truths.

It is sufficiently evident, that science is not a tree, from which we may lop off, at random, the branches that are deemed superfluous. For if nothing be superfluous, but what is pernicious or absurd, every thing which is not unfavourable to its progress, that is, every thing which can neither encumber nor obscure it, must appertain, and be serviceable to it. According to the nature of things, the whole system of truths forms a chain, the links of which are indissolubly bound together. In the present state of our knowledge, we can lay hold of and follow only insulated parts of this chain; but, in proportion

as

as we advance, the deficiencies are supplied, and the points of union, or the relations of the several parts among themselves, and of each separate part to the whole, are daily augmented. Every thing leads us to believe, that, if we were able to reduce to order, and to comprise all the branches of human knowledge in their real elements, we should no longer discover any breaks or divisions among them. They would form, if we may say so, but one organized body, the different members of which would be mutually adapted, and the different actions of which would afford reciprocal assistance to each other. Finally, by this systematic and perfect arrangement, as all the particular truths would resolve themselves into a small number of general principles, which form, as it were, a basis or common support for the former; the mind would be able to follow easily their different connections, and their numerous subdivisions, and the power of seizing them in their combinations would no longer constitute the exclusive attribute of genius.

The great importance of medical science, the benefits which society may expect from it, the advantages which the other sciences may derive from its application, and, lastly, the necessity of perfecting its principles and its plan of instruction,

tion, are so clearly evinced from the preceding observations, that it is unnecessary, in this place, to enlarge in their illustration. We shall therefore proceed to the immediate object of our undertaking, and begin by taking a survey of the state of medicine, and of medical education, during the most remarkable periods of history.

CHAPTER II.

View of the Revolutions of Medical Science,
from its Origin to the present Time.

SECTION I.

*Cultivation of Medicine by the Chiefs of savage
Tribes, by the Poets, and principally by the
Priests.*

THE obscurity, which envelops the infancy of the medical art, extends to the origin of all the branches of human knowledge. We know only, that, from the earliest periods of history, it was practised with a certain degree of success; from which we may infer, that at the dawn of the arts, it had obtained a place among them. The researches which we might be inclined to make, with regard to the manner in which it was at that time taught, would be wholly useless. Materials are wanting for such an inquiry, and the friends of truth should not lose their time in forming vain conjectures, however learned they may happen to be. At all events, it is not in a work like the present, that the elaborate, and too often fallacious inquiries of erudition would be favourably received by the reader.

To reason from the general course of nature, it is evident, that man, subjected, as he is, to the influence

influence of a variety of causes which may disorder the action of his organs, must very soon have been obliged to seek for the means of alleviating the pains, and of curing the diseases, with which he was affected. As he cannot seclude himself entirely from the constant agency of many of these external causes, as he carries within him several others, which are destined to act at particular periods of life, or which may, at any time, exert their influence; we may with safety affirm, that the first trials of particular remedies bear almost as ancient a date as the existence of man himself. Among the most rude and uncultivated tribes, as those of New Holland, and New Zealand, those of Lapland and Greenland, of North America, and the interior of Africa, we find traces of the practice of medicine and surgery. The savages in these countries know how to distinguish different diseases, and to apply a more or less suitable method of treatment; and they are acquainted with the use of several remedies, which form no part of their daily food. These uncivilized communities present to us the picture of mankind in their infancy, and give us a lively idea of the original state of all nations.

From their first existence, men must have had diseases, which they naturally sought to cure or alleviate. To attain these objects, they tried a

variety of methods. But we may presume, that their discoveries were, in general, very slow, and more frequently the offspring of fortunate accidents, than the result of rational investigation. Men, receiving by tradition a knowledge of the discoveries which had been already made, would soon find themselves obliged to make new observations for themselves; and in this manner their acquisitions would gradually increase. In these early ages, all the knowledge of the tribe formed a common stock; and their imperfect arts might be exercised by all those who were endowed with a certain portion of intelligence. Medicine, therefore, existed before there were any regular physicians.

These men, in the first stages of civilization, having their ideas necessarily confined within a very narrow sphere, and directed merely to the satisfaction of their most urgent wants, for all of which they are necessarily obliged to provide, are, no doubt, incapable of advancing the arts and sciences from their first rude state. However, we must not believe, that they are always deficient in judgment and penetration. Their senses, which are kept in a state of constant exercise, are, in general, more acute than those of men who live in a more improved state of society; and their mind, which derives every thing, in some measure, from itself, is the more just in

in its conceptions, that it is formed by a series of impressions, more striking and permanent, in proportion as the objects which produced them have been less numerous and various. The good sense and dexterity of savages are well known. It is therefore probable, that certain general views of medical science, and the employment of many important remedies, are to be referred to the earliest periods of society, at least, in those climates which favour the developement of the intellectual faculties. Certain it is, that, among the Greeks, this species of knowledge may be traced to the highest antiquity.

Medicine, we find then, was first cultivated by the patients themselves, or by their friends and relations. Each family had its traditions and particular modes of practice; and each tribe profited by the experience that had been collected by its own members.

Men of power and affluence, who were desirous to add dignity to wealth, and to become useful to their fellow-citizens, cultivated the rising arts with considerable ardour, and were far from neglecting medicine, which afforded them the means of frequently rendering very necessary assistance. Chiron, Aristæus, Theseus, Telamon, Teucer, Patrocles, Autolicus, Ulysses, and some other heroes, whose names are commemorated by the

poets of antiquity, were no less honoured, in Greece, for their medical knowledge, than for those illustrious exploits, which, whether real or fictitious, have conferred a durable celebrity upon their names.

The poets were the first philosophers among all nations, and softened, by their songs, the manners of the savage tribes. In order, however, to produce a more lively impression upon their rude imaginations, and in hopes of giving to the lessons of morality the support of a more active and vigilant power, than that of the laws, they taught the worship of the deity. It was they, too, who gave to the different languages their first and most requisite polish: and, by these means, they succeeded in early preparing all those additional advantages which are likely to accrue to the social state, from the more confirmed progress of the human mind.

Not less desirous of glory, than the heroes which they celebrate, the poets likewise applied themselves to the study of medicine; sometimes, to promote their fame by its practice; at other times, to deliver, in their works, whatever was most curious and interesting in its precepts. In these early ages, when the art of writing was but little diffused, or, perhaps, entirely unknown, the exact measures and melodious rhythm of poetry were extremely useful, for impressing on
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the memory the truths that are applicable to our daily wants. Linus, Orpheus, Musæus, and several others, have sung to us of the beneficent art which prolongs life, allays pain, and, along with health, restores happiness and pleasure. Hesiod composed whole poems on the properties of plants. In the poem intitled *Works and Days*, he lays down several medical and dietetic rules. Homer frequently speaks of the wounds of his heroes, as a man to whom the structure of the human body was not entirely unknown; and though it would be very easy, notwithstanding the extravagant pretensions of his enthusiastic admirers, to point out some gross anatomical errors in his works, it cannot be denied, that we meet with many acute physiological remarks, some curious passages about the manner of dressing wounds in his time, and several remarkable particulars respecting the action of remedies. What he says of the power of the *nepenthè*, leads us to believe, that the properties and use of narcotics were known to the ancients. With regard to the use which one of his heroes makes of the *moly*, in order to preserve himself from the sorceries of Circe, he, no doubt, followed the superstitious creed of the time. The application of wine to wounds, and the practice of incision and scarification were employed in the camp of the Greeks before Troy; all which, however, does not prove, as

some scholars would make us believe, that Homer was deeply skilled in surgery, although we are intitled to infer, with perfect confidence, that the invention of these remedies bears a date, prior to the age in which he lived.

Certain commentators admire very much the propriety of the advice, which the *silver-footed* Thetis gives to her son Achilles, when she recommends love to him as a cure for the melancholy with which he was affected. It requires no great skill in physic to know, that the pleasures of love may really dissipate melancholy; but it is equally certain, that they may also sometimes occasion it.

Pliny seems surpris'd, that Homer has not spoken of warm baths, and concludes, from his silence, that this kind of remedy was not used in his time. Philostratus maintains the contrary opinion. According to him, the hot baths pointed out by the oracle to the Greeks, for the cure of their wounded, were those of Ionia, situated at forty *stadia* from the town of Smyrna, and called the *Baths of Agamemnon*.

The plague prevailed in the camp, and was said to have been caused by the darts of Apollo; that is, by the action of a burning sun on the marshes and slimy shore of Troas. Homer says, that it lasted nine whole days, and terminated before the tenth was entirely ended. Upon the
ground

ground of this remark, it has been asserted, with more appearance of learning than reason, that he was acquainted with the powers of irregular numbers and critical days. But the doctrines of numbers and critical days* were not broached, at least in Greece, till long after his time.

The priests soon seized upon the province of medicine, and found it no difficult matter to combine it with their other instruments of power. Indeed, the medical and sacerdotal professions have, in reality, many features of resemblance. Both bring into action the same principles, hope and fear; and, although the objects of these two passions are not the same, in the hands of the priest, as in those of the physician, their effects had, at that time, nearly the same degree of influence, in promoting the views of both. Certain it is, that medicine, like superstition, exerts on the minds of men an influence proportional to their weakness; and, as the former acts upon more real and palpable objects than the latter, it is found, that the most rational and enlightened men can never entirely resist its power. In short, no art penetrates further into the human heart; no profession enables its votaries more

* They appear to have been known in Egypt, and in India; and it is probably from thence, that they were introduced by Pythagoras, their original founder among the Greeks.

easily to obtain possession of the most important family secrets; no species of doctrine (except that indeed which relates to the agency of invincible powers) affects so nearly all those fanciful ideas, in which the human mind, when it throws off the restraint of reality, is so apt to indulge; and certainly none furnishes means more independent of all political revolutions, to those who impose upon the credulity of the public, and cultivate it, like a fruitful soil, with the utmost care and attention. It was, therefore, natural, that the priests should become physicians, as they afterwards, in fact, became *.

From this time forward, medicine and religion formed but one system. In order to establish the worship of their gods, the priests proclaimed a number of miraculous cures, which were effected in their name; and in order to render their art more respected, they affirmed it to depend on their habitual intercourse with the deity.—They preached and practised physic at the same time.

According to Strabo, the gymnosophists pretended to possess a number of valuable remedies: they boasted of the knowledge of specifics for procuring a great number of children, and for getting sons or daughters, at pleasure,

* In most savage tribes, medicine is practised by the priests, or by mountebanks,

The age in which they lived was certainly more proper for the establishment of such ridiculous fancies, than the nineteenth century. The druids, in the midst of their retired forests, employed the misteltoe as an antidote to poisons and to sterility, and the selago, a plant analogous in its properties to the sabine, as a sort of universal medicine. Health, of which they pretended to be the disposers, was paid for in advance, by rich offerings, and often, even by the blood of human victims, whom those afflicted with disease conducted, or caused to be dragged to the altars.

The jewish priests appear to have been originally the only physicians of their nation. It was to the Levites, that the people addressed themselves for the cure of leprosy, and it was they who decided on the fate of the families and individuals, who were attacked with this disorder. In the porch of the temple of Jerusalem, a complete formulary of remedies was exhibited, of which Solomon was said to be the author. The Essenes, a sect celebrated for the pure and mild system of morality, which they endeavoured to propagate among an ignorant and fanatical people, cultivated the science of medicine, not only in order to render themselves more respected, but also in order to discover means to improve the minds of their adherents, by rendering their
bodies

bodies more healthy. Zealous apostles of their doctrine, they endeavoured to confirm it by the performance of cures: and by these means they were often enabled to brave the jealous fury of the Pharisees, those hypocritical and domineering priests.—They went sometimes by the name of *Essenes*, and sometimes by the appellation of *ἰατροὶ*, which signifies *healers* or *physicians*.

But it is in Egypt, that the priests carried their political system to the highest degree of perfection. It is there, that they present to the eyes of the observer a spectacle capable of exciting both admiration and terror. Riches, power, knowledge, imposture, were all rendered subservient in forwarding their monstrous institutions, and in completing the degradation of the people. Possessed of one third of the landed property of the country, they enjoyed a number of privileges and immunities. Their functions were hereditary, and their confederacy more compact than that of any clergy in the world. This formidable aristocracy exerted a violent and uniform degree of oppression on all classes of the people. It was by one of their body, that those dark and terrible words, handed down to us in the fifth chapter of Exodus, were uttered, which describe with so much ingenuoufness, the sentiments and views with which all oppressors are animated:—for the Pharaohs belonged to the sacerdotal order, and were themselves priests;
and

and the sacred fillets, that were interwoven in their crown, presented a faithful picture of their hypocritical reign, which, by its superstitious influence, exerted so powerful a sway over the ignorant people, and, by the aid of popular prejudices and the terrors of an unlimited despotism, kept in equal subjection the minds of the more enlightened class.

Nor was this all. To these different instruments of power and authority over the public opinion, the Egyptian priests joined all the knowledge of their age and country. We shall not stop to inquire, whether their knowledge was in reality very extensive, but there was none else in existence at the time; and nothing was more easy for them, than to crush every discovery, which was not made within the walls of their temples, or which they could not conveniently turn to their profit. Medicine, astronomy, and natural and moral philosophy, were all taught by them alone. They gave to every thing the colour which best suited their interests. The mysterious ceremonies of initiation served to imprint on the minds of the novices still more profound sentiments of fear and respect; and the reserved deportment, as well as the ambiguous doctrines of those Greeks who boasted of having received their instructions from them, are sufficient proofs, that, in order to obtain some knowledge of their dogmas, it was necessary to
come

come under an engagement of secrecy, or to promise to communicate them only to adepts bound by a similar oath. From these circumstances it is easy to judge, how degrading and oppressive must have been the slavery and misery of ancient Egypt, which has been regarded as the nursery of science, and as one of the first schools of the human mind.

In order to place this truth in a more striking point of view, we may further remark, that knowledge, which, when freely diffused through a whole nation, is the surest safeguard of the morals, of the liberty of the state, and of public and private welfare, becomes only an additional instrument of tyranny, and a new cause of degradation and misery, when it is confined, by established institutions, to a particular class of society.

The custom which the Egyptians had of embalming the bodies of their dead, might be supposed to have led their priests to some discoveries in anatomy; but it is easy to perceive, that these must have been very limited, if we consider the manner in which this operation was performed.

Their cotemporaries and neighbours have praised them for their profound skill in dietetics. The equable state of health and the longevity of the Egyptians were a matter of astonishment to nations consumed by turbulent passions, and addicted to excesses of every description. Need we then search for the cause of this pretended

ed phenomenon (of which the salubrity of the Egyptian climate alone is, perhaps, sufficient to afford a satisfactory explanation) in an extraordinary advancement in science, respecting the particulars of which we are possessed of no accurate information?

We know, however, that, on the subject of gymnastic exercises, the ideas of the Egyptians were wholly erroneous. They deemed them capable merely of altering the order and equilibrium of the vital functions. They were aware, indeed, that exercise may produce a momentary increase of strength; but they maintained, that it exhausted its source, and deranged its equable distribution. In order to justify, or rather to apologize for an assertion so entirely devoid of foundation, it may be said, that the heat of the Egyptian climate renders exercise less necessary to the inhabitants, and that violent exertions of bodily strength may sometimes prove injurious to persons who are accustomed to lead a sedentary life. Perhaps, too, the priests only meant to speak of gymnastic exercises, as applied to the treatment of acute diseases, of which Herodicus made so many unfortunate trials in Greece, and of which the inconveniences and dangers were so well pointed out by Hippocrates.

We see, then, that in Egypt, the priests had usurped the exclusive empire of knowledge, and that they were the only physicians of the nation.

Depositories

Depositaries of all the branches of science, whether real or false, they were enabled to tyrannize over the people, both by the falsehoods which they took so much pains to promulgate, and by the truths, of which they reserved to themselves the exclusive benefit and enjoyment. The science of medicine was taught in their temples, with those mysteries of initiation, which are calculated to create believers, rather than enlightened votaries of truth. Besides, they subjected the art to absurd regulations, which precluded all further improvement. That law, which determined the time for the application of remedies in all diseases without discrimination, prohibiting any new experiment, and even any new observation, would alone have been sufficient to keep the art in a state of eternal infancy. That law, again, which divided the profession into as many different branches, as there were diseases, or organs affected, seemed to regard the human body as a machine, the different parts of which may be separately formed or repaired, without taking into consideration the influence of the sensibility, which is distributed over all the organs of the body, and enables them to exert a reciprocal action upon one another, according to rules, which cannot always be explained by their particular conformation. Finally, that law, which obliged the son to follow the profession of his father, was, no doubt, intended to secure to each generation

generation the acquirements of the preceding age; but it evinces as great an ignorance of the real operations of the human mind, as of the circumstances which determine its first and permanent biases.

Among the Chaldeans and Babylonians, who are represented to us as having devoted their attention to astronomical studies, medicine must have borrowed from this source such views as were applicable to its particular object. We even find traces of the application of astronomy to medicine, among the Greeks, who cultivated the latter with much more success. Hippocrates himself has not disdained to make use of those general conclusions, which a knowledge of the heavens and of the course of the seasons may suggest to the skilful physician.

However, if we may credit Herodotus, the sick at Babylon were stationed in places of public resort, and remained exposed for the inspection of passengers, who were requested to furnish them with advice and the means of cure. The passengers, if they recognised, or thought they recognised, any analogy between their case and other diseases which they had formerly had an opportunity of observing, pointed out the remedies or modes of treatment, by which the latter had been cured. It is even asserted by Herodotus, that every one was obliged to give some

advice about each disease. Their prescriptions were frequently followed, and did not always prove the death-warrants of the patient.

In Greece, after the example of Egypt, medicine was at first cultivated in the temples. Several of the deities had the supposed office of presiding over the health of their votaries, and participated in their offerings, as well as in their homages. But those deities who were held in the highest veneration did not confine themselves to this profession alone. Thus, Apollo both healed the sick, and prophesied future events. His priests, however, soon finding, that the latter branch of their trade was by far the most lucrative, renounced, in his name, the practice of the medical art. Some men of sound understanding, whom these pious priests endeavoured to represent as very dangerous members of society, did not hesitate to conclude from this conduct, that idle curiosity has a far more powerful influence upon the human heart, than any other passion, and that of two impostures, the most absurd is sure to succeed best. Diana, Epione, Minerva, and Juno, had also assigned to them the exercise of particular branches of the art.

But Esculapius soon acquired the ascendancy. Certain priests of Apollo combined, in order to accomplish this holy and profitable undertaking. Seizing upon the practice of medicine, as a forsaken inheritance, from which it was still possible

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ble to derive some advantage, they erected spacious and commodious temples to the new god of health. It is for this reason, that the Greeks, whose language animated, in a manner, every object by metaphors and allegory, called Esculapius the son of Apollo. It is not difficult to divine what became of the rising art, when cultivated by these avaricious and hypocritical priests. Aristophanes informs us in what manner their deity delivered his oracles. Those who came to consult him began by purifying themselves in the lustral water: they then deposited their offerings on the altar, and reposed on beds placed in the middle of the temple. As soon as they were believed to be asleep, a priest, clothed in the dress of Esculapius, imitating his manners, and accompanied by the daughters of the god, that is, by young actresses, thoroughly instructed in their parts, entered, and informed each person of the remedy, which, from the recital of his complaint, was judged to be most conducive to his cure. As the god was not believed to reveal himself but in a dream, the patients were couched on the skins of sacrificed rams, in order that they might procure celestial visions. Not to feign the most profound sleep, even when they were perfectly awake, was an unpardonable crime. Nor was it less dangerous for the patients to presume to doubt, that what they had heard with their ears, or seen with their

eyes, was a heavenly dream. The servant, in whose mouth Aristophanes places this narrative, describes, in a truly comic manner, the craft and pious avarice of these godly men. The dexterity and promptitude, with which the priest collected and put into his bag every thing that was placed on the altars and the table of sacrifice, excited, he says, his admiration, and gave him a very high idea of the address of the god.

In Lucian's time, the impostures of priestcraft had already fallen into disrepute. But the worthless persons, whose patrimony they were, did not allow themselves to be discouraged. Those who are in the least acquainted with the history of this epoch, know what persevering efforts were employed for the revival of those articles of belief, and those practices, which had been rejected by all men of sound understanding;—efforts, which were no doubt very fruitless, but which oftener than once afforded an opportunity of observing the profound hypocrisy and audacity of these sacred impostors. We find in Lucian the history of a wretch of this description, who, having established himself in an old temple of Esculapius, sported in the most impudent manner with the credulity of the people, and even found means to entrap in his snares some old and foolish Roman senators. The relation is curious in every

every respect, and serves to shew the powerful, though generally gross artifices, by means of which the ignorant and credulous part of the people have, in all ages, been deluded*.

The ancient priests, according to Plutarch, erected their temples on high grounds, and with a fine exposure. The air respired in them was naturally pure, from the elevation of the soil, and was rendered still more salubrious, by the woods which encompassed the temples. These woods themselves became the objects of religious veneration: they were preserved with great care; and their sombre shade contributed much to the awe with which the people naturally beheld the abode of their deities. The temples of Esculapius, in particular, enjoyed all these advantages, which seemed to be more peculiarly appropriate to them; for an unhealthy abode would have been very unfavourable to the god of physic. If his advice did not always restore health, it was at least becoming, that the patients should contract no new disorders at the foot of his altars. In consequence of some prudent precautions, in this respect, many cures must have been accomplished by the diversion which the patients experienced in the course of their journey to the temples, by an exercise, to which, perhaps, they had been but little accus-

* See the *Alexander* of Lucian.

tomed, by the beneficial consequences of a change of air, by the invigorating effects which an elevated situation produces upon man, and indeed upon the generality of animals, and, lastly, by the still more invigorating effects of hope. Esculapius acted like a certain description of physicians, who possess more cunning than real talents: he established himself in situations, the salubrious influence of which left him little or nothing to do; and he maintained his reputation the better, that he had less occasion to labour, in order to acquire it.

The temples of Esculapius were very spacious; and within their walls, there were convenient lodgings for the priests; but, as the deity did not permit any person to die within them, which certainly would have been very indecorous, those persons who were afflicted with severe disorders, and women in the last stages of pregnancy, were obliged to remove to the neighbourhood; and they often remained in the open fields exposed to all the injuries of the weather. The deity, too, forbade any part of the offerings and victims to be consumed out of the temple. From this prohibition, which was, no doubt, very politic, we see, that he was both wise and provident, and had the welfare of his ministers no less at heart, than his own fame and character.

Of the great number of temples dedicated to Esculapius, the most celebrated were those of
Epidaurus,

Epidaurus, of Pergamus, of Cos, and of Cnidos. The temple of Cos was burnt in Hippocrates' time. The walls and pillars of it were covered with inscriptions, briefly describing the history of diseases, and giving an account of the remedies which had been successfully employed for their cure according to the advice of the deity. People of affluence had these inscriptions engraved on metal, on marble, or on stone; the poorer sort had them carved on mere tables of wood. However imperfect these descriptions of diseases, and of the methods of cure may have been, their collection was, nevertheless, very valuable. They formed, as it were, the first rudiments of the art, and discovered some faint traces of the method of observation and experiment, which alone is capable of placing it on a solid basis.

The priests of Esculapius were all ambitious to pass for his descendants. Those who presided over the schools of Cnidos, Rhodes, and Cos, also assumed the name of *Asclepiades*.

The school of Rhodes was no longer in existence in Hippocrates' time. That of Cos, where this great man was born, and that of Cnidos, its rival, flourished a considerable time together. To their mutual jealousy may be ascribed the progress which the medical art suddenly made at this period. Cnidos gave birth to several distinguished physicians, and among others to Euryphon, who

published the *Cnidian Sentences*, during the youth of Hippocrates, and to Ctesias who practised medicine at the court of Artaxerxes, about the same time. The latter became equally famous for the historical memoirs *, with which he enriched the literature of his country, and for his success in the exercise of his profession.

SECTION II.

Cultivation of Medicine by the first Philosophers.

HITHERTO physicians, chosen, as we have seen, successively from among the class of poets, of heroes, and of priests, had been but mere empirics, and often, indeed, but miserable quacks. They observed diseases and their symptoms, they tried different remedies, they noted their effects, and in new cases they judged from analogy. Their theory, which was as vague as their practice was undetermined, was buried, in a manner, in the details of minute and subtle rules, or was comprised in a few general propositions, which were too far removed from the actual nature of the

* These memoirs were, in reality, of no great value, and scarcely intitled their author to the fame which he acquired by them.

facts, to admit of any useful application. The ignorance of the people had spared physicians the trouble of giving a more rational form to their art, and the credulity of the public, the offspring of this same ignorance, had accustomed the more enlightened class, to a culpable system of deception and habitual falsehood.

But certain men, of a nobler character and more sound understanding, soon began to direct their attention to the study of the rising arts. At first, they employed themselves with those which related to their most immediate wants. The science of public and private morals was doubtless regarded by them as belonging to this class; and, accordingly, we see them employing their utmost sagacity in the research of its rules, exerting the strength of their judgment in their delineation, and inculcating, with all the commanding powers of their eloquence, the advantages which accrue, both to individuals and to society in general, from a rational, but entire obedience to these immutable laws. Natural philosophy, astronomy, and geometry, which sciences were all in their infancy, became at the same time the objects of their contemplation. From this investigation, superficial as it no doubt was, of the different classes of natural phenomena, they acquired the habit of a certain method in their proceedings, which soon became a sort of necessary want to them.

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When these sages afterwards came to turn their attention to medicine, they were able to throw a new light upon the science. Accustomed, as they had been, to arrange, in a certain order, the different branches of their knowledge, to trace relations between them, and to connect them together, they perceived how requisite it was to class the undigested mass of medical observations, before they could be subjected, with advantage, to the test of reasoning. And if, on the one hand, in order to discover some connecting principle among so great a number of facts, it was absolutely necessary to resort to classification; on the other hand, it was no less requisite, to impress the conclusions which were obtained, firmly on the memory, to arrange them, and to express them in the form of general rules.

The revolution, which these early philosophers effected in the medical art, was evidently a work of necessity. The time was come for drawing it forth from the recesses of the temples, and for dissipating, at least, in part, the obscurity in which ignorance and quackery had involved it. If these first attempts had done nothing more than bring it fairly to light, they would still have the merit of greatly contributing to its progress. From that time forward, a rational system was substituted in the place of undigested collections of rules;
enter-

enterprising geniuses began to connect the principles of the science with those of the other branches of human knowledge; and its intimate relation to the different parts of natural and moral philosophy, became every day more apparent to minds, whom books could not yet mislead from the path of pure observation.

These philosophers, then, freed medicine from its superstitious and hypocritical character. They transformed an occult and sacerdotal doctrine into a popular science, into a common art. This reform was of infinite service, both to medicine and philosophy; but it must be confessed, that its happy effects were, in some degree, combined with serious disadvantages. For in remedying errors, the reformers often fell into a dangerous extreme. Not satisfied with applying to medicine that general and sublime species of philosophy, which presides over all the sciences, and which alone is capable of illustrating their principles and operations, they vainly attempted to transfer to it the imaginary laws of their systems of natural philosophy, and various other conjectures, which were the more fertile sources of error, when thus applied, that the particular objects to which they related had absolutely no connection with the living system.

Thus, Pythagoras endeavoured to explain the laws of the animal economy, the formation of diseases,

diseases, the order of their symptoms, and the action of medicines, by the powers of numbers. Democritus, again, referred them to the motion, and different relations of figure and position, of the primary atoms of matter; while Heraclitus attempted to account for them by the various modifications, of which the creative and preservative fire of the universe is susceptible. It was but natural, that the hypothesis, which each of them employed for illustrating the production of animated bodies, should be also applied by him to explain the series of phenomena brought to view by their spontaneous evolutions, by the agency of external substances, by the changes of which they are susceptible, and by their final destruction, or that alteration of form which we call their death. Hence arose so many futile theories, of which we may find examples, in the works of Plato, Aristotle, and Plutarch, and from which the writings of Hippocrates himself are not wholly exempt. Empedocles, for example, the disciple of Pythagoras, affirmed, that the muscular flesh was composed of the four elements combined in equal proportions; he supposed the nerves*, when cooled

* By the term *nerves*, the ancients seem, in general, to have meant *the tendons*; however, the word appears to have been sometimes applied by them to the real nerves.

by the external air, to form the nails; he thought the perspirable matter and tears resulted from the fusion of the blood, and imagined the osseous matter of the system to proceed from the union of earth and water. Timæus of Locris framed a new system of cosmogony, from which he deduced his physiological views and methods of cure. Eudoxus, Epicharmus, Democedes, &c. adopted the opinions of the Italian school founded by Pythagoras; and their system of physic was supported and guided by that philosophy so celebrated, and yet so little understood, even by the ancients, but for which, when we consider its beneficial effects in a moral and political point of view, it is impossible not to be inspired with sentiments of veneration.

To conclude; all men of letters, whom a sedentary life and the nature of their labours dispose to melancholy habits, cultivated medicine as a subject of meditation upon themselves. Their habitual valetudinary state obliging them often to invoke its assistance, they had the additional motive of the proper care and preservation of their own health, to incite them to the study. Their first acquirements, superficial as they often were, could not fail to prove, in active minds, the germs of numerous errors. Those among them, who did not combine the observation of diseases with their theoretical

theoretical opinions, such as they had been delivered in the schools by oral communication, or detailed in the small number of written works, which existed in those early times, allowed themselves to be easily deluded by romantic notions; and the custom of ranging and systematizing all their ideas, rendered their errors more serious and dangerous.

Of all the philosophers, who at that time devoted themselves to the study of medicine, no one preserved himself more free from the spirit of hypothesis, than Acron of Agrigentum in Sicily. This bold and original genius, whom the empirics of latter times have regarded as their chief, was desirous to refer the art of medicine to experience alone. Accordingly, he reduced all the reasonings about disease, to the appreciation of the different symptoms which admitted of comparison, and to the discovery of analogies, from which he observed, that we may often draw the indications of cure. But, although he enjoyed a high reputation in his life-time, his opinions could not overcome the ascendancy of more positive and dogmatical theories; and it was not till long after, that they became the rallying point of a sect of respectable physicians*. Although, too, these opinions were less dangerous, when applied to practice, than those of

* See note [B.]

his opponents, it is but too certain, that a spirit of rivalry carried the adherents of both almost equally far beyond the bounds of reason, which, indeed, would have easily reconciled them; for the dispute, as I have elsewhere shewn*, turned, properly speaking, upon mere words.

The philosophers of antiquity, then, both improved and injured the science of medicine. They rescued it from undiscerning ignorance; but they precipitated it into a variety of hazardous conjectures: they delivered it over, from the blindness of empiricism, to all the rashness of dogmatism. In short, its lot was the same as that of moral philosophy. Medicine, at first, as placed in the hands of the poets, exhibited only an assemblage of beautiful images or refined sentiments; while, in the hands of the priests, it adopted the vague language, and mysterious tone of superstition; and, in the hands of these primitive philosophers, whose exertions, in other respects, claim our warmest acknowledgements, its scattered, confused, and undigested materials, were combined, and formed into more or less regular, and more or less perfect systems: but it usurped the principles of many other sciences, which were themselves but in a crude state; it shared in their errors, which proved the more injurious to it,

* In the work, intitled, "Of the degree of certainty to be ascribed to Medicine."

as these sciences had, for the most part, little connection with it. We may even venture to assert, that it made, in some measure, the complete round of the false systems, which prevailed in the different branches of human knowledge, and which succeeded each other by turns.

SECTION III.

Of Hippocrates and the School of Cos.

AT length Hippocrates appeared. He was of the family of the Asclepiades, and his ancestors, during seventeen generations, in a regular succession from father to son, had followed the profession of physician in the island of Cos, over the school of which place they presided. Surrounded, from his infancy, with all the objects of his studies; instructed in eloquence and philosophy, by the most celebrated masters; having his mind enriched with the largest collection of observations, which could at that time have existed; and endowed, in fine, by nature, with a genius, which was at once penetrating and comprehensive, bold and prudent, he commenced his career, under

under the most favourable auspices, and pursued it, during a period of more than eighty years, with that degree of renown; which was equally due to his talents, and to the greatness of his virtuous character.

Euryphon, as we have already seen, had just published "the Cnidian Sentences." Herodicus, too, by the revival of gymnastic medicine, the original invention of which was ascribed to Esculapius, had given to the art a more regular and scientific form. They knew how to observe diseases, and were acquainted with the most general remedies, such as venesection, emetics, cathartics, and bathing, the use of incisory instruments, and of the actual cautery or fire; and, although a certain routine, numerous false theories, and the influence of superstition, continued to deform the prevailing methods of treatment, yet the glimpses of a happier dawn were perceived, at intervals, in almost all the branches of medicine.

At this period, the doctrines of Pythagoras and Heraclitus divided the philosophical world.—Without having lost all the attractions of novelty, they already enjoyed that respect which the power of custom procures to the opinions of antiquity; a respect, which is the more profound, the more the minds of the people are rude and uncultivated.

At the same time, at Crotona in Greece, flourished the Italian school, which had been founded by Pythagoras, or, rather, by his disciples, who, improving upon his benevolent views, embraced, in their researches, all the branches of science, and made them conspire to the vast plan which they had conceived of ameliorating the human race.

It was in these fortunate circumstances, that Hippocrates appeared*, as it were, on a sudden, and procured to the Coan school, a lasting pre-eminence, to which it was doubtless well intitled, since it had been able to produce such rare talents. Amid the sports of childhood, he received, from the mouth of his parents, the elementary notions of medical science; by viewing diseases, he learned to distinguish them; by witnessing the preparation and employment of medicines, their use and their virtues became equally familiar to him. The first objects which strike the young and curious senses, the first comparisons which they suggest to the infant mind, the first judgments of growing reason, have a greater influence on the remaining part of life, as the traces which they leave, and the habits which they form, are, for the most part, indelible. It is then, that the bent of the character, and the

* He was born in the 80th Olympiad.

particular cast or direction of the operations of the mind are determined. To the fatal disposition to satisfy ourselves with words, and to affix to those we employ, erroneous or vague ideas of the things they were meant to express, may, perhaps, in a great measure, be ascribed the custom of constantly figuring to ourselves objects which we have never seen, and of substituting the fictions of imagination for the works of reality. A sound habit of judgment depends upon the justness and accuracy of the sensations; and the organs, which are designed for the reception of the latter, require culture, that is, a well-directed employment. Now, as nature or the objects surrounding us are our proper teachers, and, as their instructions differ from those of men or books, in this respect, that they are always adapted to our faculties, they are consequently the only ones which are seldom or never fruitless, and the only ones which never mislead us. We must therefore, in general, early familiarize ourselves with the images which are destined afterwards to furnish the materials of all our judgments: and, with regard to each art in particular, the man who devotes himself to it, cannot place himself too soon among the objects of his studies, or in that situation, which is most suitable to the nature and design of his observations.

Hippocrates was not less favoured by circumstances, than by nature. The latter had endowed him with the most happy frame of body: the former furnished him, from his earliest infancy, with every thing which could most successfully contribute to his education.

Good sense, joined to the faculty of invention*, is the distinguishing characteristic of a small number of privileged men: (I mean that good sense, which soars above prevailing opinions, and the decisions of which anticipate the judgments of ages). Hippocrates was of this number. He saw that too much, and yet not enough had been done for medicine, and he accordingly separated it from philosophy, to which they had not been able to unite it by their true and reciprocal relations. He brought the science back again into its natural channel—that of rational experience. However, as he himself observes, he introduced both these sciences into each other, for he regarded them as inseparable; but he assigned to them relations which were altogether new. In a word, he freed medicine from false theories, and formed for it sure and solid systems: this he with justice said, was to render medicine philosophical. On the other hand, he elucidated moral and natural philosophy, by the light of medical

* The constituents of true genius.

science. This we may, with propriety, call, with him, the introduction of the one into the other. Such, then, was the general outline of his plan.

The true philosophical spirit, with which Hippocrates was animated, is fully displayed in his history of epidemics, and in his books of aphorisms. His epidemics form not merely beautiful descriptions of some of the most severe diseases, but also point out, in what points of view observations upon them should be made; how we may arrest their most striking features, without bewildering ourselves, and without misleading and fatiguing the reader or hearer, by useless details. His books of aphorisms, have, in all ages, been regarded as models of grandeur of conception, and precision of style. Through the whole of them, we may remark that truly universal method, the only one which is adapted to the mode in which our intellectual faculties are exercised; and which, in every art, and in every science, by making the principles flow naturally from the observations that have been collected, transform the deductions from facts, into general rules;—a method, which has been only very lately reduced to a systematic form, and which, in former ages, could only be guessed at by a few men of comprehensive minds.

This new spirit of improvement, that was introduced into medicine, resembled a sudden light

which dispels the phantoms of darkness, and restores to bodies their proper figure and natural colour. By rejecting the errors of former ages, Hippocrates learned more fully to avail himself of the useful part of their labours. The connection and dependence, both of the facts which had been observed, and of the conclusions which were legitimately deduced from their comparison, were now perceived with a degree of evidence which, till then, had been unknown. All the discoveries were certainly not yet made ; but from that moment, inquirers began to pursue the sole path which can conduct to them ; from that moment, if they had been able to preserve themselves from delusion, they would have possessed sure means of estimating, with precision, the new ideas which time was destined to develope ; and if the disciples of Hippocrates had understood his lessons well, they might have laid the foundation of that analytical philosophy, by the aid of which the human mind will be henceforth enabled to create to itself, as it were, daily, some new and improved instruments of advancement.

Thus, then, this great man, far from banishing from medicine that true species of philosophy, with the aid of which it cannot dispense, extended, on the contrary, the advantages which they may derive from each other, by determining the limits that separate them, and uniting their general principles

principles and particular doctrines, by the only relations that are really common to them.

Hippocrates has not explained his method in a manner sufficiently detailed, to enable us to examine all the particulars, with a minute attention: but he points out, in several distinct treatises, the general spirit which to him appeared to be the sole one calculated to direct, with certainty, the different branches of medical research; and to improve or facilitate its instruction. Such is the object of the two essays intitled, *Περὶ ἀρχαίων ἰατρικῆς* and *Περὶ τέχνης*.

But this excellent method is far better illustrated in his practical works; for example, in his epidemics, in his books of aphorisms, in his different treatises on regimen, and I may add, in his discourse on air, water, and soils. It is in them that his medical philosophy is truly displayed, and that the author, while he instructs us in all the mysteries of a delicate and sound habit of observation, discloses to us the still more refined and difficult art of compressing the results with such a precision of reasoning, as to leave no doubt respecting their justness. Pure observations are, in some measure, the substance of his general views: accordingly, as Bordeu has remarked, the latter ought only to form the conclusion. Hence, the perusal of his works is, to this day, one of the most

F 4 100 200 31 10 instructive

instructive exercises to which we can apply; not, that the facts which are found contained in them, have not been revised by the moderns, in collections that are infinitely more ample and perfect; but because no other writer, without exception, initiates us so far into the knowledge of nature, or teaches us to interrogate her with that wise caution, and that scrupulous attention which alone can enable us to trace, from her answers, those principles and rules, which must always be recognised as genuine,

We have already observed, that Hippocrates had found in the bosom of his family, and, in a manner, around his cradle, all the means required for the developement of his genius. But he was far from contenting himself with this species of early education. Celebrated masters, in almost all the branches of science, were beginning to fix the distinguished rank which the Greek people have enjoyed among the nations of the world. We have also remarked, that the gymnastic system of medicine had been introduced by Herodicus, and was at that time in high vogue. This physician taking advantage of the predilection of the Greeks for bodily exercises, attempted to point out a general method of curing diseases by their means. Experience had taught them, that nothing contributes more to the preservation of health, and it was not very difficult to persuade them,

them, that the same means were equally proper for restoring it when lost. In ages, when ignorance was much more prevalent, the priests combined medicine with religion. Herodicus combined it with the institution most generally established in the states of Greece, with that sort of amusement, for which the common people evinced the greatest partiality*.

Hippocrates became his disciple, and profited by all the true and useful particulars which his practice could furnish. But he was one of the first to demonstrate the necessity there was for limiting the doctrines of his master in their application to practice; and more attentive observations and experiments soon convinced him, that, in a great majority of diseases, exercise not only does not contribute to the cure, but, on the contrary, renders all the symptoms more severe and dangerous.

About the same time, Gorgias the orator, delivered public lectures on eloquence, at Athens. Hippocrates regarded this study as, in some measure, the finishing part of his education. He was aware how much the talent of speaking and of writing contributes to the success of truth; and appears also to have perceived how much the art of reasoning itself is dependent on language.

* See note [C.]

It was in this excellent school, then, that he received the elements of that simple and masculine style which is peculiar to him:—a style perfect in its kind, and particularly well adapted to the sciences, by the clearness of its terms, and the force of its expression; and not less remarkable for the liveliness of its images, and for that rapidity which seems only to glance over the different objects, but which, in reality, investigates them all thoroughly, by arresting and comparing their true distinguishing features. If history furnishes us with a just account of this celebrated orator, we may conclude, that Hippocrates really owes to him, in part, the valuable talent of always embellishing his thoughts without the aid of extraneous ornaments, and of preserving his language in that mean degree of elegance, which, perhaps, is the only description of style allowable to the physician, incessantly interrupted, as he is, in his solitary studies, by the daily avocations of his profession.

Celsus and Soranus affirm, that Hippocrates also studied under Democritus. But the physician was already renowned for his practice, when he saw the philosopher for the first time. Sent for to visit him by the Abderites, he found a sage in the person of him whom these people had described to him as a mad man: but he was then too old to return to school, and if he really derived any in-

formation

formation from this supposed patient, it was solely from some short conversations which he had with him. Besides, Hippocrates seems to have given the preference to the doctrines of Heraclitus; for they form the basis of his system of general philosophy, which, in truth, is nothing but a mere tissue of conjectures: he has introduced them into his physiology, and even has not always entirely banished them from his practical observations and methods of cure.

On his entrance into the world, Hippocrates signalized himself by a very remarkable feat. Such, at least, is the account given by Soranus. Hippocrates, he says, attended, in conjunction with Euryphon, a physician older than himself, the young Perdiccas, son of Alexander king of Macedonia. This prince was afflicted with a slow fever, of which no one could discover the cause, but which sensibly undermined his health and strength. The penetration of the young physician led him to suspect that the disease depended upon some moral affection. As he was observing attentively the demeanour, the words and gestures, and even the most delicate feelings of his patient, he perceived, that the presence of Phila, who had been formerly a mistress of his father's, caused him to change colour. He accordingly pronounced that love alone was capable of curing the complaint which it had occasioned; and, as the fair Phila shewed

shewed herself not insensible to the situation of the young prince, the exhibition of a very gentle remedy had the desired success. A cure of a similar description is attributed to Erisistratus.

Hippocrates, after the example of the philosophers of his time, undertook various journeys. He traversed the whole of Greece, and its colonies, and the greater part of the islands of the Archipelago: he even extended his route northwards, as far as the provinces which were inhabited by the wandering hords of Scythians. Thessaly and Thrace were the two parts of Greece in which he resided for the greatest length of time. His observations on epidemical diseases were made at Larissa, Perinthus, Thafos, Olynthos, Œniadæ, Pheræ, and Elis.

In the harangue of the deputation, which is ascribed to Theffalus his son, it is said, that Illyria and Pæonia being ravaged by the plague, the inhabitants of these countries made an offer to Hippocrates of considerable sums of money, in order to induce him to come to their relief; but that certain winds, which at that time prevailed, led him to foresee, that the malady was likely to penetrate into Greece, and he was unwilling to quit his own country, at a moment of such urgent danger. By his orders, his two sons, his son-in-law, and his disciples repaired to the different states, with the necessary instructions and remedies, both for preventing
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ing the spreading of the contagion, and for curing those persons who were already infected. He himself went to Theffaly, and from thence, some time after, to Athens, where his advice was productive of such great benefits, that he was honoured, by a solemn decree of the people, with a crown of gold, and was initiated into the sacred mysteries of Ceres and Proserpine.

This relation can, with difficulty, be reconciled with that of Galen and Thucydides. Galen says expressly, that the plague of Athens, during which Hippocrates gave such useful counsels, came from Ethiopia. It must therefore have been the great plague which Thucydides has depicted in such striking colours. Now, this plague first began to rage during the Peloponnesian war, in the second year of the 87th olympiad, and it is universally agreed, that the date of Hippocrates' birth is about the 80th olympiad. According to these several data, he was, therefore, only thirty years old, at which age he might have been skilled in physic, but could not well have had two sons and a son-in-law, in a condition to practise. Besides, how comes it, that Thucydides has not even recorded his name in a description so accurate and so detailed? How comes it, that, on the contrary, he expressly asserts, that the physicians did not understand any thing about the nature of the disorder, that the patients died, with equal certainty, whether

ther attended by physicians or not; and that even the physicians themselves were carried off in proportionably much greater numbers, because their duty obliged them to be constantly near the persons of those infected with the disorder? —In the mean time, till these difficulties shall be removed, the author of the travels of the young Anacharsis admits as certain the facts which are reported in the oration of Thessalus.

Among the letters ascribed to Hippocrates, there are many which are evidently supposititious; as, for instance, those addressed to Cratevas, who lived in the time of Pompey; those to Dionysius of Halicarnassus, who was cotemporary with Augustus; those to Mecænas, the favorite of that too celebrated emperor; and those to Philopœmen, the general of the Achæan league. But the two letters of Democritus to Hippocrates seem to bear the stamp of truth. The philosopher reminds him of their first interview, and of the subjects of their conversation. “I was at that time engaged in writing,” he says, “upon the order of the universe, the direction of the poles, and the course of the stars. You had an opportunity of judging, that the madness was on the part of those who accused me of being insane.” The answer of Hippocrates is worthy of them both, and breathes a profound sentiment of melancholy. In it, he complains of the fatigues of his profession, of
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the unjust censures to which it is exposed, and of the ingratitude of the public towards those who exercise it with most zeal and ability. Though advanced in age, he does not scruple to confess, that he was yet far from having carried the theory and practice of his art to that degree of perfection, of which they are susceptible; and he declares, that, in the course of a long life, which had been devoted to the service of his fellow creatures, and which had not passed without some degree of renown, he had been oftener blamed for misconduct, than praised for success.

Yet, no one ever was more deserving of happiness than Hippocrates. No one ever distinguished his sojourn on earth by more signal services, or by the constant exercise of more exalted virtues. And no one ever formed to himself more sublime ideas of the duties of his profession. These we may find sketched and compressed, as it were, in the oath of his school: in several passages of his writings, he has recorded them in the truly affecting language of virtue and of truth; and, what is of more consequence, he practised them with sentiments of benevolence, which should render his memory as much cherished and beloved, as his genius and works have been respected and admired.

In enumerating the qualities which are necessary for a physician, and the most effective means for developing and cultivating them, he seems, in

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a manner, to describe himself, and to deliver his own history. "A physician," he says, "should be decent in his external deportment; his manners should be grave, and his conduct moderate. In the intimate relations in which he is placed by his profession, with regard to the sex, it is incumbent upon him to shew great reserve and respect; and to have the sanctity of his functions constantly before his eyes. He ought not to be envious, nor unjust towards his brethren, nor absorbed in the love of gold. He must avoid shewing himself a great talker; but, at the same time, he must be always ready to answer the questions which are asked him, with mildness and simplicity. He ought to be modest, sober, patient, dextrous, and ready to perform every office appertaining to his art, without feeling in the least discomposed. He ought to be pious without superstition, and honest in all the common affairs of life, as well as in the exercise of his profession. In short, he ought to be a perfectly good man; and to join to the purity of an upright heart, prudence, genius, talent, knowledge, and address, which alone can render the practical application of the rules of his art productive of real utility."

In another place, he observes, "In order to improve, to a certain degree, the knowledge and practical skill of the physician, it is necessary (in-

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“ dependent of natural genius, the place of which,
 “ indeed, nothing can supply) that he be placed,
 “ from early infancy, amid all the objects of
 “ his researches, and that every means of in-
 “ struction be employed with unremitting assiduity: a mind docile and prudent, a talent
 “ of sagacity matured by study, a spirit of well-
 “ directed activity, and, above all, much time
 “ and labour, are essential requisites for improvement in the art.”

Hippocrates' own education had been conducted according to the plan he describes: and the model which he formed to himself of a virtuous physician is the picture of his own life; all the strokes of it are drawn from his own heart. It is not merely the number of patients who were cured by his skill and attention, or the poor who were relieved by his acts of beneficence, or the unfortunate persons who were consoled by his compassionate advices, who may be said to proclaim the praises of this great and excellent man: he was also a worthy citizen; he defended and graced the sacred cause of liberty, which the corrupting gold of the Persians placed, perhaps, in much greater danger, than their arms. His bold and generous sentiments were not the only homage he paid to a divinity, which all great minds adore, and from which all real virtue and happiness proceed. For we cannot pass over in

silence the endeavours which the Persian king made to entice Hippocrates to his court, the refusal of Hippocrates, and the noble manner in which he explains the real motives of his conduct. A senatus-consultum of the city of Athens, and several letters, which are recorded in it, recount these circumstances with sufficient minuteness*.

Persia happened to be ravaged by the plague. The governors of Asia Minor wrote to Artaxerxes, to inform him of the high reputation of the Coan physician. Artaxerxes answered them, and desired them to make him the most liberal offers, in order to induce him to visit his dominions. The governors forwarded the letter of the Persian king to Hippocrates, and promised, in his name, every reward and honour that he could desire. The physician returned an answer in these striking words, which ought to be engraved on the memory of all those among his successors, who can think, and who can feel. "I have in my own country the food, the clothing, and the habitation I require: I want nothing more. As Greek, it would be unworthy of me to aspire to the riches and grandeur of the Persians ;

* I have already cited it in the Essay "On the degree of certainty to be ascribed to Medicine": but may, perhaps, be allowed to repeat the quotation at a time, when certain writers seem to be using their utmost endeavours to fiddle all free and generous sentiments.

“ and to serve the foes of my country and of liberty.”

Upon hearing this, the Great king, whom the intoxication of power had easily persuaded, that his caprices should become laws to the rest of mankind, and that there was none who ought not to esteem himself honoured by obedience to them, could not contain his wrath: but immediately wrote to the inhabitants of the island of Cos, ordering Hippocrates to be delivered up to him without delay, as he was determined to punish his insolence; and threatening them, in case of refusal, with all the terrors of his vengeance. But the different states of Greece were then united by ties that ensured their common independence. The little island of Cos dared to brave the Persian king; and the inhabitants replied, that they would consider it as an act of the basest ingratitude, to deliver up their fellow-citizen, to whom they were under many important obligations; and that, by making choice of their island for a place of residence, and for the exercise of his profession, he had merited the special protection of the laws, by which it was governed; and concluded, by declaring their firm resolution to defend his life and his liberty, at all hazards*.

* See note [D].

After a long life, spent in the successful practice of his art, and in laying the foundation of a system of doctrines, on the principles of which his theory and his practice depended; in perfecting its plan of instruction, and in forming disciples worthy to supply his place; after a life, which, of course, must have been happy, whatever he himself may have said of it, in moments of irritation and disgust, Hippocrates died at Larissa in Thessaly, at the age of 85, or 90, or 104, or even 109 years, if we may credit Soranus his biographer. He was buried between that city and Gyrtona, and his tomb, according to tradition, was for a long time covered by a swarm of bees, whose honey was employed, with great confidence in its efficacy, for the cure of apthous disorders in children.

Death is the supreme judge of merit and renown. His terrible hand tears off the mask of the impostor; but renders the great man still greater, and, as it were, more sacred, than before. Death commonly silences envy, at least discourages its efforts; or, from the certainty of being no longer importuned by their presence, the envious often acknowledge all the worth of talents and virtues, and allow a tribute of respect to be paid them, the excess of which shocks their feelings the less, as it tends to depreciate the living. The sufferings, with which mankind have almost always sought to embitter the lives of the greatest benefactors

and

and brightest patterns of the human race, are then viewed in all the blackness of their ingratitude, by those who are endowed with any portion of generosity:—their senseless ashes are heaped with eulogies and honours; and the man who was constantly persecuted with fury, during the time he should have enjoyed the good wishes of his fellow-citizens, becomes the object of their worship, when their praise or censure can no longer affect him!

After his death, Hippocrates received universal testimonies of respect and admiration. His genius and his virtues were duly appreciated, and the services which he had rendered to his country and mankind were fully acknowledged. During those early stages of civilization, it was customary for the Greeks to exalt their illustrious characters to the rank of gods: their lively and enthusiastic imaginations led them to transfer all their benefactors to heaven, whence they supposed them originally to descend: they were pleased with the belief, that the person who, during his abode upon earth, had been able to do much good, would be able to do so always; and they felt more confidence in claiming assistance from the hand, which had already served them. Hippocrates, accordingly, had temples erected to him; and his altars were covered with incense and offerings, like those of Esculapius himself; and since there must needs

be a deity to preside over the sick, who could be more worthy than the Coan physician, to receive their prayers, or the vows of their parents and friends !

The physicians of every school, the philosophers of every sect, were eager to read, to quote, and to comment upon his writings. Each school was desirous to pass him for its head ; each sect was ambitious to possess him. In all those countries where the arts and sciences have been held in esteem, his name has been echoed from mouth to mouth, along with those of the small number of men of original genius, who have been justly regarded as the creators of the human mind. Among the physicians of succeeding ages, those, who are most deserving of renown, have been most forward to proclaim the fame of Hippocrates. Moralists and politicians have borrowed enlarged views and liberal principles, from his writings. The philosophers, who direct their attention to the processes of the understanding, have admired that sure method, those operations of a mind fully acquainted both with the limits of its powers, and the extent of its means ; and that happy art of placing himself in a true light, for observing the different objects of his researches, for classing the observations according to their natural order, and for combining them with general principles ; that is, for drawing conclusions, which

which but express their relations and connection. The legislator has given the authority of law to his opinions, in all questions, with respect to which the physiologist must direct the decision of the magistrate. The men of letters have found in him, as we have already remarked, the model of a peculiar style, and even, we may add, of an eloquence, which combines dignity, with artless simplicity; a rapid flow, with accuracy of detail; the colouring of a glowing imagination, with the severity of a strong and exact mind, that sacrifices every thing to truth; and, lastly, the most perfect clearness, with the most admirable conciseness. And, even in our time, continuing to be studied by physicians, to be consulted by philosophers, and read by all men of taste, he is, and always will be universally respected, as one of the most distinguished ornaments of antiquity; and his works will always be regarded as one of the most valuable monuments of science*.

We have dwelt, at considerable length, on these early epochs, which are unquestionably the most important in medical history. We shall pass more rapidly over the succeeding periods.

* See note [E].

SECTION IV.

Of the other Schools of Greece.

THE school of Cnidos, the rival of that of Cos, is only known to us by what Hippocrates himself records concerning it. If we may credit the whole of his account, it appears, in its plan of instruction, to have combined the disadvantages of a blind empiricism, with those of a system of conjecture: for he affirms, that, on the one hand, they considered diseases only, in an individual point of view, and without reducing them, by means of their analogies, to certain classes, genera, and species; while, on the other hand, they did not hesitate to ground, upon these insulated observations, certain rules of practice, which, from the impossibility of referring them to any fixed and general standard, left no durable impression upon the mind.

The school of Pythagoras, or the Italian school, produced distinguished characters in various walks of science, and also gave birth to several able physicians. This truly extraordinary man, after having embraced in his researches all the branches of natural and moral science, projected the most extensive plan of education, which ever entered into the mind of any single individual.

individual. He succeeded, too, in accomplishing his object, and established his school upon so firm a foundation, that it continued to flourish, with undiminished lustre, for a long time after his death; and tyrants and fanatics, with fire and sword in hand, imagined it to be their duty to attack it, and destroy it.

For estimating the merits of this philosopher, we are in possession only of a few fragments that have escaped the wreck of time; but, if we transport ourselves to the period, in which he lived, these small remains may well excite our astonishment.

It probably was Pythagoras, or some of his disciples, who introduced into medicine the doctrine of *numbers*, that is, who endeavoured to reconcile the general observations, which had been made on the animal economy, with the principles of their favourite system. The power of numbers, and the advantages which the ancients supposed to result from the knowledge of their properties, in the study of the other sciences, have been frequent subjects of ridicule among the moderns. Nor have they less derided the supposed predilection, that nature was believed to have for certain numbers, or for certain periodic forms, which, according to their ideas, produce a regular recurrence of these numbers, in the phenomena of the universe. Many parts,

parts, too, of the Hippocratic physiology have not been more kindly treated ; not excepting the doctrine of critical days, which, by their regular revolutions, reproduce the sacred numbers of the Pythagoreans. It remains to be ascertained, whether the opinions, in regard to these different points, have been all equally just.

When we consider the progress, which the ancients had made in geometry, and still more, when we reflect on the just and profound view which they took of the science of numbers, we can scarcely doubt, that they must have made important discoveries with respect to their properties. The application of these discoveries to geometry, with which an arithmetic of some kind is necessarily connected, naturally occurred to their minds. From geometry, they might extend the employment of it, to various branches of physical science ; and we know, that they actually did this, witness the splendid achievements of Archimedes in statics and mechanics. Long before this, Pythagoras, with the assistance of the experimental analysis, had been able to refer the vibrations of sonorous bodies to the laws of calculation. To conclude ; the activity of these enterprising minds, who took such delight in generalization, must have led them to introduce, into moral science, those views or instruments of research, which had aided them so powerfully in
their

their other studies. Supposing this conjecture to be as well founded, as it appears to be, we must allow, that their system of numbers must have been to them, what the science of algebra, which is only a more abstract and universal species of arithmetic, is become, in many respects, to the moderns,—the universal method, and almost universal language of the sciences. Like it, the numerical system of the ancients, imperfect as it appears to have been, might have thrown a direct light upon many branches of research, and might have served as a standard of comparison, and regulator of the methods of others; it might have furnished them with means of correcting their errors, or pointed out to them the way to supply their defects.

No reasoning *a priori* leads us to believe, that nature prefers one number to another. But this is a question of matter of fact, which observation alone can solve. Suppose that, in a game of backgammon, fives were thrown twenty times running, the rational probability of their recurrence at the one-and-twentieth throw would be still the same. Yet what player, in such a case, would not bet with confidence against such a return?

From experience alone we learn, that, in consequence of the natural variety observed in fortuitous events, there is always reason to
wager

wager against those which have already occurred frequently, and in favour of those which have not yet taken place.—It is, therefore, from facts, and from facts alone, that we must judge of the doctrine of numbers. In those phenomena, which appear to us the most irregular, and the least capable of being subjected to rule, experience shews us, that there is still a certain order observed. Why, then, may not the ancients have discovered, in different operations of nature, that order which numbers must follow, in order to produce their recurrence, at stated intervals? I am very far from affirming that such an order really exists; but it may be the case, and the ancients may have observed it, and it does not appear to me, that we are entitled to contradict them flatly on this point, till we shall have made all the experiments that are required for a complete solution of the different questions relating to the doctrine, and till we shall have made them on a sufficiently great scale, and for a sufficient length of time, to remove all the difficulties on the subject.

With respect to the periodical order of the vital actions, whether in the formation and evolution of the different organs, or in the alterations of their functions, and in the crises of diseases, we are in possession of a considerable collection of facts, which may enable us to form a
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more decisive judgment. Hippocrates, Galen, Aretæus, and several others among the ancients; their abbreviators, Lommius, and Sennertus; their commentators, Duret, Jacot, Houlier, Prosper Martian; and their adherents, Baillou, Fernel, Rondelet, Prosper Alpini, Piquer, and several others, among the moderns; and lastly, many observers of particular diseases, whose authority possesses the more weight as to the accuracy of the facts, that they confined themselves to a simple historical narration, and had no favourite system to establish; all these writers, I repeat, seem to have conspired together, though with different objects in view, to confirm, in this branch of medical research, the justness of the doctrine of numbers, as adopted by the ancients.

Assisted by latter researches, Stahl not only adopted their opinions, but extended and enlarged them; and even applied them, in a more exact and comprehensive manner, to the explanation of the phenomena of the living system. In some particular treatises, he has combined them with several new and ingenious views respecting the periods, the progress, and the conversion of different diseases, both acute and chronic. Hoffmann, who was of a more timid disposition, has followed Stahl pretty closely, in many of his excellent dissertations. Boerhaave himself was, in the end, obliged to acknowledge
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the accuracy of the ancients ; and all the skilful practitioners of his school have not hesitated to adopt this doctrine of critical days, which, at first, had been rejected, as absurd, and in some measure cabalistical.—But I have already expatiated too much on this subject.

At a very early period, as we have before observed, Acron of Agrigentum had traced the outlines of the doctrines of the Empiric sect ; but their principles were not reduced to a regular system, nor arranged in a didactic form. This task was reserved for Serapion, the founder of the famous school of Alexandria, which continued to flourish during a long course of years.

I have above remarked, that the controversy between the Dogmatists and the Empirics, was a mere dispute of words. The one party, however, conducted their proceedings according to certain rules and axioms, and occupied themselves about remote and proximate causes of events ; while the other confined themselves solely to experience, and rejected all hypothesis, as tending to weaken the force of observation. But the Empirics reasoned from experience, and the Dogmatists experimented (if we may use the expression) with reasoning, and regarded as causes those circumstances, which the former had introduced into the history of the disease. Analogy and induction were to the Empirics, what the connection of their dogmas and

and their methodical application to the plans of cure were to the Dogmatists; but the former had the advantage of commencing the subject more directly. The name, even, which they bore, the terms which they employed, as well as the fundamental rules which they had prescribed to themselves, led them constantly back to the true road of analysis, which should always begin with observation.

If the Pneumatic sect had not produced Aretæus, it would scarcely deserve to be noticed. Some visionary speculators have, at different times, been desirous to revive it: their efforts, however, have proved ineffectual: their reveries have left no traces behind them, and are now scarcely remembered.

Aretæus, even at the present time, is regarded as one of the most accurate observers, and as one of those excellent describers of disease, whose remarks will be always replete with instruction; although they date from the earliest stages of the art.

SECTION V.

*From the Time of the Introduction of Medicine
at Rome, to the Epoch of the Arabians.*

ROME became the mistress of the world. Her tyrannical government completed, by oppression, the ruin of the nations, which she had subdued by the resistless force of her arms. She transported, with violence, to her bosom the arts and sciences, or, rather, the masterpieces they had produced; which she snatched from others, without knowing how to appreciate and enjoy them herself. The riches of the whole universe were poured in, to glut her insatiable avarice. Luxury soon followed in their train; and the astonishing productions of the happy ages of Greece had the effect of attracting, from all parts to Rome, the philosophers, the men of letters, and the artists of that unhappy country, who could now find nowhere but in the capital of the world, those objects which they required for the culture of their minds, and which were still dear to their hearts.

Physicians were for a long time prohibited, by the magistrates, from settling at Rome. On this subject, there remains a letter of Cato the Censor, which is truly curious, on account of the stupid ferocity it breathes. That violent
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and prejudiced man thought to govern the possessors of the wealth of the universe, like a convent of monks, or as he managed his own household. Parsimonious, cruel, and capricious, he is well known to have ruled over the latter with the most tyrannical sway. In order to combine all sorts of despotism, he himself assumed the care of his family and slaves when sick; and the means which he employed for this purpose evince the most disgusting ignorance, and most ridiculous superstition.

However, the manners of the people soon became more refined, by the immediate influence of the new sources of enjoyment which wealth had opened. The necessity of procuring men of information, in every department of knowledge, was very generally felt, and physicians, at length, were allowed to appear.—Accordingly, they soon arrived in great numbers; but the era of their establishment cannot be regarded as very glorious for their science; * though Asclepiades, soon after, conferred upon it a considerable degree of lustre.

Practitioners seldom attract public notice, by pursuing a simple and regular line of con-

* Cassius Hemina, quoted by Pliny, says, that Archagatus was the first who introduced the art of medicine into Rome: that they at first allowed him a shop, with the title of *healer of wounds* (*vulnerarius*); but that they soon changed this appellation to that of *executioner*, on account of the torments which his operations occasioned.

duct. The human mind, in almost every situation, contracts particular habits, and, perhaps, has received from nature that disposition which leads it to search for the wonderful, and to embrace with eagerness whatever is marvellous and extraordinary. For engaging its attention, the simple truth proves often insufficient: we must astonish, in order to convince; and transport the mind beyond the bounds of the visible world, in order to obtain its assent*. Asclepiades, educated as he was, in the schools of eloquence, and a rhetorician himself, introduced into physic the art of deluding the judgment by the power of the imagination. It is not very difficult to succeed in this art with the sick, whose infirmities so often render them credulous and superstitious. Novel methods of cure, fanciful remedies, bold philosophical views, far removed from common opinions, a rich and fertile vein of eloquence, and an inexhaustible fund of indulgence for the caprices of those who committed themselves to his care; these were the means which this man employed, who, without being a real physician, was by no means destitute of talents and information.

* This observation applies with most force to nations in a state of ignorance; but gradually becomes less applicable, in proportion as they advance in civilization.

The corpuscular philosophy of Democritus, extended and improved by Epicurus, had been adopted and cultivated only by a small number of persons, and was regarded with a sort of dread by minds of a timid cast. It was, perhaps, on that very account, that Asclepiades was so successful in making it the basis of his system of medicine. By means of corpuscles and pores, he explained every thing; he astonished the people, and was sometimes successful in effecting a cure. He laughed at the ideas of Hippocrates, on the subject of critical days; he ridiculed his patience in observing nature, in order to aid her, or supply her wants; and termed his system *a Meditation upon Death*.

The opinions and practice of Asclepiades did not long survive himself. From their remains, however, arose the Methodic system of physic, the founder of which was Themison, at present less known by his doctrines, than by the line of Juvenal;

“ Quot Themison ægros autumnò occiderit uno.”

The Methodists divided diseases into three classes: into those of *constricted fibres*; into those of *relaxed fibres*; and into those which were called *mixed*. In the first, they employed laxatives; in the second, they exhibited astringents; and in the last, both laxatives and astringents.

But, in the treatment of chronic complaints, they had recourse to their grand remedy, which they termed the *analeptic*, or *resumptive circle*, and which consisted of a succession of fanciful remedies, applied at stated intervals, and in a determinate order.

We may form some idea of what they meant to designate by the term *diseases of constriction*; though it certainly is not so intelligible to men of science, as it appears to the uninformed class; we may also conceive the meaning of the phrase *relaxed fibres*; but it is difficult to divine, what they could understand by their *mixed species*, or how they could apply to practice this speculative notion, which is so very subtle, as to elude all clear conception. Besides, is it not evident, that almost all diseases belong to the *mixed* class, or may be referred to it? For this word (if it signify any thing) must mean an *inequality of tone* in the different organs, or an *irregular distribution* of the vital power*. Now the majority of diseases present the general phenomenon of a derangement of equilibrium, or irregular expenditure of living energy. In those cases, in which these deviations from the healthy standard are less obvious, an observing eye may still perceive them; and, perhaps, there is no disease in which

* So that certain parts may be in a state of *constriction*, while others are in a state of *relaxation*.

a deficiency of equilibrium is not in some degree manifested, whether it be in the tone of the different organs, or in the exercise of life, and distribution of the sensibility of the system. Thus, then, the *mixed species* of the Methodic sect, by comprehending every thing, becomes, in fact, applicable to nothing.

With regard to the two other classes, though we should not, perhaps, reject entirely the terms by which they are designated, yet the doctrine, which they tend to establish, is certainly of a very limited application, and furnishes very few sure indications for practice.

Cælius Aurelianus, whose work contains much useful matter, has given us a detailed exposition of the principles of the Methodic system. He had adopted them, and employed them with skill; but had not been able to impart to them that character of practical truth and general utility, which they so essentially wanted.

Prosper Alpini, in the sixteenth century, and Baglivi, in the eighteenth, endeavoured to revive this doctrine. They both conducted the attempt with genius, but without success. Others have presumed to attempt it, without the recommendation of genius: but the small portion of ephemeral fame, which they acquired, generally terminated with their life, and their names scarcely deserve to be recorded for these fruitless essays.

After several centuries, in which it made little progress, and after numberless commotions and errors, the science of medicine stood greatly in want of more accurate methods of inquiry. It was high time for it to recur to the precepts of nature, or to those of her faithful interpreter, Hippocrates.—Galen at length appeared.—Endowed with a genius sufficiently comprehensive, to embrace all the sciences, and to cultivate them all with equal success, he, even in early infancy, gave proofs of uncommon capacity; and while pursuing his youthful studies, began to perceive the futility of the prevailing systems. Dissatisfied with what his masters taught him as incontrovertible truths, and as the immutable principles of the art, he read Hippocrates' works, and was struck, as it were, with a new light. In comparing them with nature, his astonishment and admiration redoubled; and Hippocrates and nature thenceforth became the only preceptors, to whose instructions he would listen. He undertook the task of commenting upon the writings of the Father of medicine; he presented his opinions in various lights in which they had not been hitherto regarded; he repeated his observations; he extended them, and supported them with all the aid which philosophy and natural science are capable of affording them, either by the simple comparison of facts, or by the collation of different theories,

ries, or, finally, by the combination of different methods of reasoning. In short, Galen revived the Hippocratic system of medicine, and communicated to it a degree of lustre which it did not possess in its primitive simplicity. But, at the same time, what it gained in his hands must be confessed to have more the appearance of dress and ornament, than of real solid acquisition. The observations which had been collected, and the rules which had been traced by Hippocrates, in assuming a more splendid and systematic form, lost much of their original purity. Nature, whom the Coan physician had always followed with so much accuracy and caution, became obscured, and, in a manner, stifled, by the foreign pomp of different sciences or dogmas; and the art of medicine, overcharged, as it was, with subtle or superfluous rules, only entangled itself in a number of new and unnecessary difficulties.

Bordeu compares Boerhaave to Asclepiades; and may, indeed, have found some features of similitude between these two celebrated physicians: but the character of Galen bears a much stronger resemblance to that of the Leyden professor. Both appropriated to themselves the knowledge of the age in which they lived; and both endeavoured to apply it to medicine. In reforming the latter upon great and comprehensive plans, they attempted to combine with it a variety of doctrines

which are entirely foreign to it, or which, at most, bear to it relations of an insulated and merely accessory nature. Both were desirous to enrich their systems of physic with every thing which they knew besides. Thence it comes, that while they simplified with method, though often in a very unequal manner, the general views which should govern its system of instruction, they have, nevertheless, left a great task for their successors to accomplish,—the task of separating, with accuracy, many just and beautiful ideas, from the hypothetical dogmas that disfigure them, and which the order itself, of their connection, renders still more dangerous for young students, too easily seduced, as they are, by such comprehensive views.

Galen was the physician of Marcus Aurelius. It is with a lively interest, that we peruse, in his works, the account of some disorders with which that philosophic emperor was afflicted, whose life and writings present the happiest model for the imitation of those men, who hold in their hands the destiny of nations, and whose name, in every age, must be a satire upon all who have not followed his example.

SECTION VI.

Epoch of the Arabians.

FROM Galen to the time of the Arabians, medicine appears to have revolved in the circle of the opinions, which we have seen successively prevail among the Greeks. Its condition during the continuance of the Eastern Empire is little worthy of attention. We might, perhaps, in this interval, find some observations worth collecting, with respect to the hospitals, which were at that time established at Constantinople, and in several other cities of Greece in Europe and Asia: but this subject has but a remote connection with that now under consideration.

The Alexandrian library, which had been formed by the unremitted care of a long succession of princes friendly to the cause of learning, was burnt during the war between Cæsar and Pompey. A violent insurrection having taken place in the city, Cæsar ordered the ships that were in the harbour to be set on fire. The fire communicated on a sudden to the buildings of the library; and not fewer than 400,000 volumes were consumed by the flames.

However,

However, this loss was in a short time replaced, at least, as far as it could well be. Antony made a present to Cleopatra of the library of Pergamus, which contained 200,000 volumes. This stock was by degrees augmented: the books attracted men of letters, and the men of letters, on the other hand, created an influx of more books. In this manner, Alexandria became again the emporium of the sciences and arts.

Medicine, in particular, was taught there with much success. Students from all quarters of the globe resorted to it, to receive the instructions of the most celebrated masters in the world: and this school, which had been founded in the happiest ages of Greece, was still enjoying an undiminished degree of credit, when the conquest of Egypt by the Saracens took place.

Amrou, who commanded the expedition, was desirous to save the library: The answer of Omar is well known. Thus a treasure of incalculable value to the whole human race, perished through the barbarous fury of Mussulmen.

Yet the proscription was less general with respect to books of medicine, of natural history, and of natural philosophy. Some few escaped destruction, either on account of the interest, which even the most stupid men take in the science that promises them health, or an alleviation of their
their

their complaints; or, as some writers are of opinion, on account of the idea, which generally prevailed in the East, that they would learn from them the art of making gold*.

The first versions of these books, that appeared, were in the Syriac language; for the Arabian translations are of a later date. The works of Aristotle and Galen were those for which the Arabians evinced the most enthusiastic admiration. They translated them with the greatest care, and commented upon them in different ways, and with different views. Their subtle minds were admirably adapted for the Peripatetic system of metaphysics, and for that farrago of abstract propositions, which bears down the small number of just and ingenious views it contains. Their literati, who were as fond of pillage as their warriors, appropriated to themselves the ideas that were to be found in works of little note; and sometimes did not scruple to lay claim to

* John the Grammarian was at that time residing at Alexandria, and made great, and not altogether unsuccessful exertions, to save a few manuscripts. Theodocus and Theodunus, both physicians of celebrity, were probably also in the city, when it fell into the hands of Amrou; at least, there is reason to believe this from the relation of Abu-Offaiba, their biographer. Now, if this was the case, there can be no doubt, that they would use their utmost endeavours to save the most valuable remains of the art.

whole books, only taking care to suppress the name of the author. Even their most celebrated writers are not altogether free from this reproach.

To the Arabians we are indebted for some important improvements in the art of preparing medicines. They introduced into practice the use of mild cathartics, or lenitives. And Rhazes, an Arabian physician, is the first who describes the small-pox*. The moderns, no doubt, have far surpassed him in the observation of the different characters it assumes, and of the appearances it exhibits, according to the age, the temperament, the state of the body, and the epidemical constitution prevalent at the time when the disease occurs: but it is delineated with much accuracy in his writings; and till the time shall come, when the practice of inoculation (simplified as it has been, by the beautiful discovery of Jenner) shall have completely effaced it from the catalogue of diseases, Rhazes and some other Arabians, who have treated of this disorder, will continue to be read with much profit.

The works of Hippocrates were translated into Arabic, at the same time with those of Aristotle and of Galen. But his simplicity, his precision, his doctrines founded upon experience, that prudent philosophy and rigid method, which observes

* See note [F].

with care the footsteps of nature, were far from exciting the same degree of enthusiasm, as the scientific pomp and imposing luxuriance of the two others. And indeed the Arabian systems of physic have always retained this cast; for in them we look in vain for that genius, and that delicacy of discernment, which are to the science of medicine, what taste is to the polite arts.

If we regard merely the absurdity of the enterprise, and the stupid ferocity which gave birth to it, the Crusades were nothing more than a cruel and superstitious disorder of barbarous times. But we must, at the same time, admit, that they became very powerful means of weakening, and diverting the force of feudal tyranny; and, above all, that they tended to enlarge the intercourse between the ignorant Europeans, and the Saracens, who, at that time, were more enlightened. It also appears, that we are indebted to them for the first notion of the municipal system of law. It was at Jerusalem*, that a class of citizens suddenly emerged from amid the christian armies, and that their chiefs, by conferring upon them different functions of the magistracy, were enabled, by their aid, to keep in subjection those bands of turbulent nobles, who till then had known no authority.

* See Gibbon on this period.

Besides,

Besides, the better informed part of these nobles, who returned to Europe, brought with them a number of new ideas. The flourishing aspect, of the towns and palaces, inhabited and embellished by the Arabian chiefs, and the luxury and conveniences which they exhibited, had naturally inspired them with new desires; and, either from this circumstance, or from their connections with the Genoese and Venetian merchants, the Crusaders began, first, to perceive the value of the arts, and, afterwards, that of the sciences which elucidate them, or of the literature which enlivens them, which serves them for guide, and forms, as it were, their necessary accompaniment; and soon diffused a taste for them through the Western world.

The unfortunate remains of the Alexandrian school, which had escaped the fury or rapacity of the Saracens, were collected by the emperors of the East. While the Arabians endeavoured to promote the advancement of science in Asia and Spain, Greece retained some faint traces of her former splendour. The scenes of so many glorious exploits, of so many feats of genius, and of the industry of its ancient inhabitants, were still before their eyes. The first productions in the most beautiful language that ever was spoken were in the hands of every one; the monuments, of which the avarice of the Romans had not been
able

able to deprive them, and those, which the luxury of the emperors of Constantinople had raised at a vast expence, supplied their lively imaginations with ideas that favoured the developement of all the mental faculties : and if it had not been for the theological disputes, which the folly of princes had kindled, their genius might have shone with a lustre, at least, as strong as can be expected to emanate among a people that has lost its liberty.

SECTION VII.

Introduction of Medicine into Europe from Greece, with Men of Learning, and with Literature.

AFTER the capture of Constantinople by the Turks, the men of letters, accompanied by their books, took refuge in Europe. Italy was near at hand; and the two countries continued to be united by ancient political, religious, or commercial relations. It was, accordingly, to Italy that these unfortunate fugitives retired, carrying along with them those treasures with which Europe was to be enriched,—those valuable collections of Grecian works, which, till then, had been but very imperfectly known there, and which afterwards

wards seconded so powerfully the reanimating impulse, of which Italy had already experienced the first beneficial effects.

The works of the Arabians spread their fame through all the dominions of the Caliph; and the bordering nations began to look with envious eyes, upon those favoured provinces. Commerce had established some little intercourse between them; and had created several new wants and desires. In a short time, the youth from all parts of Europe repaired to Spain, in order to enjoy, at the source itself, the benefits of this rising light. The Arabian schools, accordingly, came into vogue, in the same way as the Grecian schools had done before them. Arabic soon became the language of the learned, and it was through it that the Europeans first became acquainted with the works of Hippocrates, of Galen, of Aristotle, of Euclid, and of Ptolemy. But the science of medicine, amid this agitation of opinions, made no real progress.

However the Greeks, who had taken refuge, in Italy, distributed copies of the books they had brought along with them; and taught and illustrated, in public lectures, the doctrines which were contained in them. In these consisted all their wealth: accordingly, they endeavoured to diffuse a taste for them, and to enhance their value as much as possible. Theodore
Gaza,

Gaza, Argyropylus, Lascaris, and Bessarion prepared correct editions of them; and Aldus printed them. The works of Dioscorides appeared first; and after them those of Galen, of Paulus Ægineta, and of Hippocrates. Their publication tended greatly to lessen the credit of the Arabians, whose numerous plagiarisms were so very striking, and whose inferiority, in every respect, soon began to be perceived. But the infatuation was too great and general, to be completely overcome. Aristotle and Galen, whose reputation was still undiminished, secured to Arabian literature a portion of that authority which it had usurped in their names.

In vain had the school of Salerno, which had been founded towards the middle of the seventh century,—in vain had it procured for the place of its establishment, the name of *Civitas Hippocratica*. In vain had the works of Hippocrates himself been put into the hands of the men of science in Europe, in their original form, and no longer in the disguise of Arabian translations and commentaries. The time of his celebrity among the moderns was not yet come; and for the revival of true medical science it was, perhaps, necessary, that the round of error should be first completed.

SECTION VIII.

Of the Jewish Physicians.

IT was through the Jews, that the Europeans first learned the advantages which different countries may derive from commercial intercourse, and were apprised of the wealth which the agents of their reciprocal exchanges may acquire, by the exercise of this sort of traffic. Forming a close and distinct fraternity in all parts of the world, they naturally became the agents, the brokers, and the carriers of the other nations. The insecurity of the seas and highways had led them to devise more easy and convenient methods for transporting money-securities. They accordingly became our factors and bankers, before the use of reading was known: and they were also our first physicians. The Oriental languages were familiar to them, and at a time when Galen, Hippocrates, and the other fathers of medical science, were known in Europe only through the medium of Arabic and Syriac translations, the Jews were almost the only persons, who, by taking advantage of the labours of antiquity, knew how to treat diseases with any sort of method.

Their theoretical opinions and general systems are detailed, at full length, by Riolan; but they
are

are no longer deserving of notice. Their practice, however, was more successful. All the different sects, which had arisen among them, while they existed as a united people, had combined the study of medicine with that of their religious tenets. We have already observed, that the Essenes and *Θεραπευταί* were renowned for their skill in the treatment of diseases, and that the name of the latter signifies *healers*. They even pretended to work miracles, and the ignorant class of this people (perhaps at that time the most stupid and most fanatic of any nation in the world) were often inflamed to such a degree by these supposed miracles, as to alarm the Pharisees, who were the titular proprietors of the national worship.

It is believed, that the university of Sora, which was founded in Asia by their Rabbins, dates its origin from the 200th year of the christian era. The Jews migrated to Spain along with the Moors, who resembled them in many of their customs and opinions, and who receiving, as they did, considerable assistance from them in supporting their armies, naturally allowed them liberty to form their different commercial and scientific institutions.

The Jews had schools at Toledo, at Cordova, and at Grenada; and medicine was an object of particular instruction in them. Huarte, in his "Trial of Wits," affirms, that the Jews are the most proper

persons for the exercise of the medical profession. This people, mingling as they have done, with all the nations of the globe, have constantly, and in every situation, retained their original character. The authority of a legislature, that separates them from the rest of mankind, has stamped all their habits, and impressed even the features of their face with indelible traces; and the cruel and unceasing persecution, of which they were, especially at that time, the victims in all parts of the world, has rendered this distinction more complete and irremovable. Huarte says, that their temperament and character are precisely those most suitable for a physician. The subtilties by which he endeavours to support his opinion, may not, perhaps, produce conviction; but one thing is certain—that in his time the most esteemed, and, probably, also, the most able physicians were Jews.

It is well known, that Charlemagne placed great confidence in Farragut and Bengesta, and that Charles the Bald entrusted the care of his health to Zedekias. Francis the First was desirous to have a physician of the same nation, and wrote to Charles the Vth, requesting him to send him one from his court; but the person whom the latter recommended to him being suspected of christianity, he ordered him instantly to depart, without even deigning to consult him on the subject of his complaint.¹³⁷

When

When the priests secured to themselves the exclusive exercise of the medical art, in several of the Western states of Europe, as they had formerly done in Greece and Egypt, they intrigued with the Popes and Councils, in order to excite every species of persecution against the Jewish physicians, whom they justly regarded as very dangerous rivals. They obtained formal excommunications against those who committed themselves to the care of Jews; and they prevailed upon weak princes to prosecute, with all the rigours of the law, such of the latter as dared to possess knowledge, and to succour their fellow-creatures. But these anathemas and prohibitions had no effect upon any but the common people, who were consigned to the care of ignorant friars, canons, or deacons, and upon obscure individuals among the Jews, who did not enjoy the protection of potentates, or of men of rank and influence.

In France, in particular, the priests were successful in their endeavours to become the absolute masters of the medical profession. They, among other things, enjoined celibacy to all those who exercised it. Accordingly, the physicians finding no longer any advantage in remaining free, were induced to enter into orders, which held out to them the prospect of rich benefices, prebends, abbeys, and even bishopricks. Thus Fulbert, Bishop of Chartres; Lombard, Bishop of Paris;

several monks, such as Rigord, author of the Life of Philip Augustus, and Obizo, Abbot of St. Victor, and physician of Louis the Big; lastly, several prebendaries, as Robert of Douay, physician to Margaret of Provence; and several inferior and untitled ecclesiastics, as Roger of Provins, physician to Louis the VIIIth, all united the profession of medicine with the priesthood, and acquired, by these means, great wealth and repute. The Lateran Council, held in 1123, censured, in very severe terms, this species of amphibious beings*, who disgraced both professions by their avarice, their impostures, and their scandalous lives. But the French priests and monks bade defiance to its thundering anathemas: and it was not till three hundred years after, that common sense, and a regard to propriety and the public good, triumphed finally over their artifices. A special bull, procured by the Cardinal d'Estouteville, which permitted physicians to marry, effected their complete separation from the clergy, and by this means alone, put a stop to a great variety of shameful abuses.

From that time forward, the Jewish physicians were less subject to persecution: they were allowed to settle in considerable numbers, in France,

* They also practised as lawyers, in which capacity their extortions were equally infamous.

in the Netherlands, in Holland, Germany, and Poland; and they every where acquired an ascendancy over the other physicians, which was too uniform to be ascribed to any thing but real talents.

At present there exists scarcely any memorials of this great success in practice; the views and observations of so many men, who were held in the highest estimation by their contemporaries, now repose along with them in their tombs: We learn that they cured diseases; but the particulars of their exertions are unknown to posterity, and have been lost to the progress of the art.

SECTION IX.

Of the First Sect of Chemical Physicians.

THE science of chemistry, as well as medicine, had been introduced into Europe by the Arabians, who, having been long conversant with the art of distillation, had subjected various simples to chemical processes, and had produced several new and useful remedies in their laboratories. Their chemical theories, crude and undigested, were promulgated in Europe, along with their

translations of the Greek authors. The operations, by which bodies are decomposed and reduced to their elementary principles, and which enable us to recompound the same bodies, by the reunion of their scattered elements, or produce, by means of new combinations, other substances, endowed with properties to which we find nothing analogous in nature:—These operations, so astonishing in themselves, were calculated to fill with stupid wonder a set of ignorant minds, whose ideas formed, as it were, but an assemblage of errors. The early chemists, accordingly, were regarded as forcerers, and were obliged to exert great caution and address, in order to avoid being torn in pieces by the people. But, at last, the principle of curiosity, the thirst of the gold, which they expected to make, and the love of life, which they hoped to prolong by the products of this new art, triumphed over the terrors of hell, from which they believed it arose. Deceitful hopes, couched in the obscure language of the prevailing superstitions of the time, allured those who were endowed with ardent minds; and the mass of absurd fictions, which they already possessed, seemed insufficient to exhaust and satiate their credulity. In times, indeed, when knowledge is much more generally diffused, we may observe this principle to be continually in quest of new objects: the discovery of error appears

pears to be a painful feeling to the human mind, for which it endeavours to console itself by searching for fresh illusions.

Accordingly, they flattered themselves with the hope of being able to make gold, to cure all diseases by a single remedy, and to render man immortal. It was by pursuing these chimeras, that the chemists of Europe made their first discoveries, and that several men of superior genius, in other respects, extended and improved them. Such, too, were the first steps of a science, which now, after having passed through the hands of some genuine philosophers, is arrived at that degree of accuracy in its operations, which must henceforth preserve it in the sure road of advancement;—a science truly sublime in the objects of its researches, and in the universality of its methods, and which is, at once, the general key to all the branches of natural knowledge, the true guide of the arts, and the most formidable barrier against those very superstitions, in the midst of which it originated among us.

It is a remarkable circumstance, that those among the alchemists, who were most infatuated with these absurd expectations, possessed, however, some sound ideas, or, rather, some happy views with regard to the science of medicine. At a time, when the schools were every day becoming more and more imbued with the scientific prejudices

prejudices of the Galenian and Peripatetic systems of physic, the alchemists, urged on by their enterprising genius, and stimulated by the predilection which they felt for extraordinary ideas, and for new and untrodden paths of pursuit, began to form a just conception of the principles of the animal economy. They soon perceived, that it was necessary to separate its study from that of dead matter, and that the beings, who are endowed with life and sensation, are subjected to different laws from those which govern inanimate objects. Arnould of Villanova, Raymond Lulle, Isaac le Hollandois, and Paracelsus, may all be said to have been treading in the path of the Hippocratic system. Paracelsus, whom the solitary practitioner, cited by Bordeu, calls the greatest fool of physicians, and the greatest physician of fools, was unquestionably the prototype of mountebanks—a perfect pattern of pride, madness, and impudence. From the obscurity of the ale-houses of Basle, he practised upon the credulity of princes, and even of some men who were, in other respects, very enlightened for their age. Leaving these disgraceful haunts, and attended by a multitude of infatuated adherents, he poured forth a volley of lies, absurdities, and abuse against his rivals. He proscribed every thing which was not his—he cried with a frantic voice, “Away with Greek, Latin, Arabian!” and he publicly burnt

burnt the works, the fame of which he was desirous to destroy.

Such was Paracelsus, who fancied himself a great man, because his name was oftener mentioned in all parts of Europe, than that of any of his cotemporaries. Since that time, the severest justice has succeeded this infatuation, and there is not a single physician, whose opinion is allowed to have any weight, who has not perceived the inconsistency of his ideas, and the extravagance of his pretensions. How often have all the odious and ridiculous features in his conduct been exposed and detailed! And yet, justice compels us to acknowledge the real services which he rendered to science; the utility of the remedies which he first introduced into practice, or which he employed with more boldness and success than his predecessors; and that peculiar sort of sagacity he possessed, which, without meriting the name of real genius, prepares the mind for certain discoveries, to which a more cautious mode of procedure never could have led.

Paracelsus had perceived the principal errors of the prevailing systems of physic, and had some distant idea of the reforms which they required; and if his natural disposition had allowed him to do justice to those whom he impudently copied, while he was abusing and reviling them; if he had not been constantly obliged to work upon the
passions

passions of the multitude which surrounded him, he, no doubt, would have been able to promote to a great degree, that revolution which was destined, sooner or later, to effect the revival of the true science of medicine in Europe.

SECTION X.

Revival of Learning and the Hippocratic System of Medicine.

BEFORE the capture of Constantinople, the trade and manufactures of some towns in Italy, had revived, in that country so favoured by nature, a taste for science, for literature and the arts. The Italian language, formed as it was from the remains of the Latin, and on which so many hordes of barbarians had left the traces of their progress and oppressive dominion, had at length assumed a more settled character. Some original, and even elegant writers in it, began to imitate the classical beauties of which the ancients have left us such transcendent models. It was found to be susceptible also of other beauties, of a less simple nature, but which seem to be inherent to it, and which a captious taste alone would wish entirely to proscribe.

Italy

Italy served as an asylum for those men of letters who had fled from Constantinople; and was the first to experience the happy effects of the knowledge they had brought with them.—Ancient literature soon became generally diffused throughout the country, and taste made rapid progress, owing to the influence of a genial climate and the most enchanting scenery in the world, or to the presence of many of the masterpieces of art, which had been transmitted from the happy ages of antiquity; or, finally, to the progressive impulse of industry and commerce, and the encouragement which some enlightened governments gave to men of learning and of science.

The Italian had already become a rich and harmonious language. It was now suddenly brought to the highest pitch of refinement, in the same way as all the languages of modern Europe have been improved,—by the attentive study of the great models of antiquity: and the conflux of all the learned men of Europe to Italy, bore some faint resemblance to those brilliant periods in Grecian story, when it was customary to see all those among the neighbouring nations, and even among the conquerors of the world, who had learnt to know of how little value human life is without the lustre of talents, and, above all, without the light of reason—when it was customary

tomary to see these men repairing from all quarters, and mixing with the disciples of the celebrated philosophers and orators of the times.

Among the patrons of learning and the promoters of knowledge, there are none whose memory has been more honoured by posterity, than a family of Florentine bankers. The Medici, indeed, have done more for the advancement of philosophy, of literature, and the arts, and consequently for the happiness of succeeding ages; than all the princes and kings of the earth put together. Highly respected, as long as they were satisfied with the noble and liberal exercise of their trade, and did not aspire to any other species of influence than that derived from the popularity which they acquired by their talents and their virtues, they have left immortal testimonies of their worth, and have impressed with a deep sense of gratitude the hearts of all the friends of philosophy, of literature, and the arts: and the merit of having so powerfully contributed to the progress of the human mind, ought, perhaps, to outweigh the reproaches which, in other respects, they have too justly deserved.

The two greatest men among the Medici, were unquestionably Cosmo and Lorenzo.—The glory of Cosmo is more pure; but the career of Lorenzo was more splendid; and even the most rigid judges are forced to allow him the praise of brilliant

liant and noble qualities. Who, indeed, was ever found to combine, in a more eminent degree, the sincere love of his country, with great political talents, and the elevated sentiments of a generous mind, with that skill and address which enabled him always to preserve his popularity? Yet, it was only by the most fortunate accident, that he escaped from a plot of assassination, in which a pope, a cardinal, and an archbishop, were concerned, and the execution of which no one could be prevailed upon to undertake but two priests; for common ruffians shuddered with horror at the idea of committing so great a crime in the church, and during divine service*.

Lorenzo de'Medici was not only a warm patron of philosophy, of literature, and the arts; but he also contributed by his own writings, to the diffusion of that sublime and liberal system of morality of the Platonists, which, though unfortunately founded on principles that will not bear the strict test of reason, has, at least, the recommendation of inspiring the mind with sentiments of conscious dignity.

* “ Disse (Monteficco) che gli non bastarebbe mai l'animo, commettere tanto ecceso *in chiesa*, ed accompagnare tradimento col sacrilegio.”

Machi. lib. 8.

For further details, see The Life of Lorenzo de'Medici, by Roscoe.

The poems of Lorenzo also deserve to be ranked among the benefits which he conferred upon learning. Although not free from the blemishes of his age and country, they are distinguished by a tincture of melancholy, and grandeur of conception, which we should be glad to meet with more frequently in the works of the Italian poets.

The writings of Hippocrates were now pretty generally known, and were taught, illustrated and commented upon, along with those of Plato. Physicians cultivated literature, and men of letters were in general physicians. In vain did Petrarch, jealous of the repute which the rising art began to enjoy, utter the most violent invectives against it and against all its votaries: necessity, which is much more powerful than hatred, soon suppressed the outcry of this poet, and of some other wits, who had been at great pains to collect from the sacred as well as profane authors, every thing which could injure the cause of medicine, and tend to degrade it in the public opinion.

The sudden appearance of the venereal disease, which had commenced its ravages at the siege of Naples, in 1494 *, and which rapidly spread over Italy, France, Spain, &c. had rendered the assistance of the art more indispensably necessary, and consequently had conferred upon it a greater degree

* See note [G].

of importance. The anatomical discoveries of Vesalius and Columbus; the practical success of Berengar of Carpi, and the classical labours of Mercurialis, Capivacci, Calvus, and Prosper Martian, had procured it a degree of credit in Italy, little inferior to what it had acquired during its most flourishing period among the Greeks: and the human mind, freed from the shackles, which had stunted and distorted its exertions, and after having exhausted, if we may use the expression, its taste, upon the arts of rhetoric, poetry, painting, and sculpture, began to seek new food for its activity, among the different branches of natural and moral science.

While the Italian tongue made such rapid improvement, the French and the other European languages, were in a very languishing state, and, indeed, were daily becoming more and more disfigured by the fragments of the Greek and Roman idioms, with which they endeavoured to conceal their poverty.

Medicine advanced with more equal steps; and in Italy, France, and Germany, made nearly similar progress. The schools began to assume a new character: that of Paris, in particular, distinguished itself by the most complete and successful revival of the Hippocratic system; and perhaps the best commentators upon this great man have been produced in this school. I shall content myself

myself with mentioning, in this place, Jacot, Dürët, Houlier, and Baillou, the perusal of whose works will always be instructive for practitioners. This same school, too, had the honour of educating and possessing Fernelius, whose comprehensive mind was able to reduce to a regular system the most extensive knowledge, and to communicate it in a style which was at once extremely philosophical and elegant. About the same period, Fabricius of Acquapendente among the Italians, Fabricius Hildanus in Germany, and Ambrosé Paré in France, reformed, in some measure, the art of surgery. The two last enriched it with very accurate and circumstantial descriptions of diseases and their methods of cure. The former, collecting those which already existed, arranged and combined them in a systematic form: while, on the other hand, Guy de Chauliac gave a correct view of the state of surgery in his time, and, in particular, of the four Sects into which the whole body of practitioners were divided*.

However, the intercourse between the different

* The first of these sects followed Roland, Roger, and the Four Masters*; the second were adherents of Brunus and Theodoric; the third, of William of Saliceto and Lanfranchi; and the fourth consisted of the German surgeons, who to their bandages, ointments, and potions, added the use of charms.

* See note [H].

nations of the globe, which was daily becoming more easy and habitual, redoubled, in some measure, the emulation of men of science, and produced an extensive diffusion of learning. The discoveries which were made in one country began to be no longer unknown to its neighbours. Voyages and travels were multiplied, and, by their means, each celebrated professor, from his chair, or from the privacy of his study, spoke, if we may say so, to the whole civilized world.

Linacre went to Italy to procure the knowledge, which, at that time, there were not the means of obtaining in England. He became the disciple of Demetrius and of Angelo Politian, and lived in the strictest intimacy with that assemblage of men of learning, whose fame had induced him to quit his native country: and when he came back to England some years afterwards, loaded with the most honourable spoils, his return was distinguished by a marked public service. Linacre prevailed upon King Henry the VIIIth, to whom he was principal physician, to found the College of Physicians of London;—a respectable institution, which, even at the time of its establishment, was productive of real benefit, and has since continued to increase in splendour and utility. Linacre was President of it at its opening, and exerted his utmost endeavours to promote its welfare; and, in order to associate his name still more

closely with the advantages which he expected to accrue from it to his country and to the art, he bequeathed his own house to the College, with the intention, that it should continue to be the place of its meetings, and the scene of all its labours.

SECTION XI.

Of Stahl and Van Helmont.

DURING the last century, chemistry experienced a sudden revolution in Germany. This change, which had an astonishing influence upon the progress of natural science, was effected by Becher, and his disciple Stahl.—Stahl was one of those extraordinary men, whom nature seems to produce, from time to time, for the purpose of effecting the reform of the sciences. She had endowed him with that keen sagacity, which enables the mind to investigate thoroughly the objects of research, and with that prudence, which leads it to pause, at every step, in order to consider them in all their different aspects; with that quickness of apprehension and comprehensiveness of understanding, which embraces them in their combinations; and with that patience in obser-
vation,

vation, which follows them through all their minute details. He was, like his master, chiefly distinguished by the rare talent of tracing analogies and points of comparison, between the most ordinary phenomena, and those which appear most unaccountable; by the aid of which it is frequently possible to discover the immediate cause of the latter, and thus to found the most sublime theories upon the most simple reasonings. It would be foreign to our object to enumerate the chemical labours of these two great men: it may suffice to observe, that they were the first who introduced philosophy into a science, which, till then, had been constantly fluctuating between a small number of important truths, and a multitude of absurd errors, and which, from the very nature of its researches, seemed destined to remain for a long time the inheritance of quackery, or the deceitful object of the most extravagant hopes.

Stahl undertook to accomplish in medicine, what he had before effected in chemistry. He had been educated in the doctrines of Hippocrates, and none knew better than he, the improvements they were capable of deriving from the observations and philosophical views of the moderns. He perceived, that the first thing to be done, was to separate the general ideas, or principles of medical science, from all extraneous
K 3 hypothesis.

hypothesis. He had remarked, that, as medicine employs itself upon a subject governed by particular laws, the study of no other object of nature is capable of disclosing, at least directly, those laws; and that the application of the doctrines which have been most firmly established in other branches of science, to that which has in view the knowledge and due regulation of the animal economy, necessarily becomes the source of the most pernicious errors.

Every age has its peculiar taste and fashion. The same sciences are seldom cultivated, for a great length of time, with the same degree of ardour: they give way to others: and all of them, during these transitions, experience changes, more or less favourable to the improvement of their systematic arrangement. At different periods, medicine has assumed the tone of the prevailing sciences: it has even endeavoured to speak their language, and to subject itself to the same rules: so that it has passed successively through all the different systems, that have acquired any degree of celebrity in the world. The necessity of confining it within the sphere of those facts, with which it is strictly connected, and which alone can afford just views with respect to the human frame in a state of disease, and useful indications of cure; this necessity, which had been formerly recognised by Hippocrates, had been also distinctly

tingly perceived by Bacon. Stahl accomplished, at least in some respects, what Bacon had merely pointed out.

The ideas of Stahl have, in general, been very imperfectly understood : We may even assert, that they have been almost equally disfigured by his censurers and by his admirers. The causes of this misunderstanding deserve to be detailed in a particular work. It would, I think, be useful to exhibit the Stahlian system, in more determinate points of view, than the author himself could possibly have done. Hitherto the points, in which it is distinguished from the doctrines of the ancients, and those, in which it is related to them, have never been precisely ascertained. Perhaps too, it would be advisable to conclude a work of this description by a systematic view of the progress of the science since the time of Stahl, and of the future advances which we have every reason to expect at no very distant period. It would probably result from this investigation, that the reforms, which have been already effected, and those which may be hereafter accomplished in the same spirit, must be ascribed, in a great measure, to this extraordinary man ; both on account of the sound ideas which he directly established, and of the impulse which he communicated to public opinion. It would too, I am persuaded, appear, that, notwithstanding the haughty man-

ner in which the adversaries of Stahl have attacked him; notwithstanding the awkwardness in which some of his disciples have defended, explained, and commented upon his works, still his influence has not been less powerful in medicine, than in chemistry, and that to both sciences he has rendered everlasting services. In this place I shall content myself with observing, that even his smallest performances are replete with enlarged views, and, at the same time, abound in valuable minute remarks; and that the great work, which contains the exposition of his general theory, is liable to erroneous interpretations, merely from the indefinite meaning of a leading term, which sheds its obscurity over all the accessory and subordinate illustrations;—an obscurity, however, in which the author deemed it prudent to envelope his doctrines, in order to shield himself from persecution.

The phenomena of life depend upon a cause; or, to speak more correctly, are the result or natural consequence of some preceding event, which we know only by the subsequent events connected with it, that is, by the phenomena themselves. To this cause different names have been applied, at different periods of medical and philosophical history. Hippocrates called it the *impulsive principle*, ἐνορμῶν. Since his time, it has received successively the appellations of *soul* or *anima*, *nervous*

vous power, sensibility, vital principle, solidum vicum, &c.

When the distinction between mind and matter was established in a formal and dogmatic manner, what had formerly been the *soul*, now became the *mind*; and philosophers, in league with the theologists, regarded it as immaterial. The *body*, therefore, was distinguished from it, by the circumstance of its being body; and in order to explain the functions of the different organs, they adopted, according to the opinions of the age or country, various causes or powers, which they believed to be material as well as the body, but subjected by unknown relations to the mind, their common regulator. Certain notions of a still more dogmatical nature having led to the opinion, that thought is exclusively a function of the mind, essential even to its existence, and of which the exercise continues, without interruption, during the whole course of life, and terminates only at the dissolution of the body; the word *soul*, consequently, could no longer be restricted to the designation of the first cause, or abstract idea of the phenomena of life; but was used to express the principle of thought, or thought itself, and, in ordinary language, was employed to denote the moral being, or the whole assemblage of our ideas and sentiments.

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From among all the terms which seemed fit to express the moving principle of animated bodies, Stahl chose the word *soul*; and for the following reason: According to him, this principle is indivisible, and exerts an equal influence upon all the organs of the body; and the differences, which are observable in their operations, or in the results of these operations, depend on the structure of the parts, which modifies, in some measure, the principle itself, and causes it to experience the affections, or to produce the actions, peculiar to each of these organs. Thus, it digests in the stomach, breathes in the lungs, secretes the bile in the liver, thinks in the head, or principal dependencies of the brain. Such was the doctrine of many ancient philosophers; such, too, was the opinion of some of the first fathers of the church, and particularly of St. Augustine, who has delivered it, in a manner both clear and ingenious, in his short treatise, "*De quantitate animæ.*" By this doctrine, they did not attempt to explain the nature and primary essence of the living principle, which is completely inexplicable: but they were freed by it from the inconvenience of being obliged to resort to the double or triple *soul* of the Platonists: and as, upon the supposition of its immateriality, its action upon the body, with regard to all the movements which thought and volition produce, has never been called in ques-
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tion, it was not more difficult to conceive, that it acted in like manner upon it, with respect to all the functions where thought and volition are not concerned; and *that*, too, according to the laws, which, in St. Augustine's opinion, are essential to the union of mind and matter, or what he believed to constitute living man. But the ignorance or duplicity of modern schoolmen made them refuse their consent to the discussion of opinions, which they themselves held, but which they did not understand: and they found, and, perhaps, will long continue to find it more convenient to issue anathemas, and to persecute.

If Stahl, then, had made use of any other term than that of *soul*, to which he carefully avoided attaching too precise a meaning, he would have found it difficult to escape the reproaches of impiety and materialism, and, what is still worse, the implacable fury of persecutors, who at that time formed a very powerful party. A single word was sufficient to preserve to him the reputation of orthodoxy, and to secure his tranquillity. This consideration must appear a sufficient apology for that ambiguity of expression, which pervades his writings; although it may have become the cause of many theoretical blunders, and even of several practical errors, into which some enthusiastic admirers of Stahl have fallen: and although it was very easy to prove, that

that the unity of the vital principle is equally consistent with all the various ideas we can form of its nature, it appears that Stahl did not place great reliance on the sound reasoning, or on the candour of the theologists of his age.

In order to do justice to the views of Stahl, the greatest man of his profession, who has appeared since the time of Hippocrates, it would be necessary, I repeat, to enter into a detailed exposition, not only of his general principles, but also of a great number of particular ideas, which serve to illustrate and confirm them.—Some persons, who judge upon the word of others, without reading for themselves, and others, who judge in the same way, even after having read, regard him merely as the author of theories, which captivate the imagination, but from which no real practical advantages can be derived. From my own experience, on the contrary, I am convinced, that there is no writer more capable of teaching the true method of observing nature, and of suggesting happy expedients at the bedside of the patient. His theory of the chronic affections of the abdomen, confined within those limits, beyond which the author does not appear to have been desirous to extend it, is susceptible of the most frequent and general application; and his treatise On Hemorrhages is, without exception,

ception, the most valuable production, in practical medicine, of which modern times can boast.

After having spoken of Stahl, it is incumbent upon us to make some mention of Van Helmont. Not, that Van Helmont is at all deserving of being ranked with Stahl; for, in no respect, can he be compared to him: but because both of them have, with unequal powers, and by different paths, arrived at results, nearly similar, and differing, perhaps, only in the language in which they are expressed. Their opinions, too, have been developed and connected together, by men of genius, whose judgment, having sufficient firmness to brave the tyranny of prevailing opinions, has rescued these two original characters from the oblivion that seemed to await them. It is in this state of alliance, if we may say so, that their theories have reappeared in our schools. It is from the pens of these distinguished writers, that they have acquired, at least in this country, a degree of renown, which has contributed not a little to the real advancement of the art.

Van Helmont had spent his youth in studying the works of the adepts. Endowed by nature with a glowing imagination, he increased its ardour by his acquaintance with them; and the fire of their furnaces had the effect of completely inflaming his mind. Yet, amid the tarnish of alchemy and superstition, by which his
ideas

ideas are too often obscured, vivid gleams of light are at times observed to appear. It was in pursuing the path of error, that he made several fortunate discoveries, and it was in the language of quackery, that he announced the sublimest truths.

Van Helmont was one of the most inveterate opponents of the Galenian system, and of the schools that were most in vogue in his time. He, indeed, allows no opportunity of attacking the latter to escape him; and he frequently combats them with great justness and discernment. Nothing, certainly, could be more unlike his system of physic, than that which was then generally taught; but the circumstance of thinking differently from the rest of mankind is not always a sure criterion of thinking rightly.

Van Helmont has the merit of being the first who demonstrated the influence which the epigastric organs exert upon the rest of the system. Some obscure hints of this influence, were, no doubt, to be found in Hippocrates; but the latter appears to have noticed it merely for the purpose of observing the narrow limits within which he supposed it to be confined. No one, after his time, seems to have paid particular attention to the subject, till Van Helmont perceived the potent action of the stomach upon the other organs of the body, and that of the digestive power upon their respective functions. He remarked,

too, that the diaphragm, which is placed both as a partition and means of communication between the thorax and abdomen, becomes, in consequence of its connections with other parts, and the vicinity of some of the most important viscera, a principal centre of action in the economy of the living system.

Numberless facts may be adduced in support of this opinion. The physicians of the Montpellier school have collected those that are most striking, and have illustrated them in different works, with much more method and perspicuity, than Van Helmont ever could have done.

Each organ has a sensibility peculiar to itself, although closely connected with, and subordinate to that of the whole system: particular properties serve to distinguish it from all the other organs; and certain functions are exclusively ascribed to it. Van Helmont supposed, that the characteristic distinctions of the different parts of the body, depend upon the causes that animate them, and believed, that in each organ there resided a principle, charged with its government; that a superior principle, to which the author gave the name of *Archæus*, has the superintendence of all the rest; and that, from their concurrence and systematic combination, the general principle of life results, in the same way as the body itself is formed by the union of all the members.

members. The great *Archæus* is supposed to reside at the superior orifice of the stomach; whence, as it were from his throne, he issues his orders to the inferior *archæi*, according to their different jurisdictions. The latter, though obliged to obey even the caprices of the former, take care always to add something of their own, either good or bad; and it is in all these operations combined, that the regular actions of the healthy state, and the anomalous appearances of disease consist.

The art of medicine, then, according to the above theory, consists in the faithful study of the character of the common central principle, and of the nature of the other inferior principles; in knowing when to rouse their industry, or repress their rage; and what are the proper means of governing their passions, or correcting their mistakes.—All this translated into common language implies, that, in animated bodies, there exists a general cause of the operations of life; that the different organs, though constantly dependent upon this cause, have, nevertheless, certain modes of being affected, and of acting peculiar to themselves, which are the necessary consequence of their particular structure; that the object of medicine is, to trace the laws by which this cause is governed; to determine the modifications which it undergoes in different parts of the system, and in different circumstances; and to ascertain the

the means of operating, both upon the whole system in general, and upon any organ in particular, in order to preserve or re-establish the regularity of its functions.

This doctrine is confirmed by the observation of nature. It was upon it, too, that Van Helmont grounded his practical views. Unfortunately, he fancied that genius could supply the place of observation, and rejecting with disdain the facts which had been collected by his predecessors, he boldly adopted plans of treatment that were entirely novel. After the example of Paracelsus, he aimed at the prolongation of human life; he flattered himself that he had discovered the secret, and proclaimed it with the greatest assurance; and, like his predecessor, he shortened his days by those brilliant discoveries, which ought to render their authors immortal.

Among his works of pure and genuine practice, even his adversaries acknowledge the merit of his *Treatise of the Stone*.—In it, his theory is rendered much more clear; and, even at this day, we may profit by the perusal of this original essay. We may also find, in various passages of his other writings, several useful views on the subject of fever and catarrhal affections, and particularly on the relations of asthma to epilepsy;—relations from which the author deduces a very intelligent plan of cure.

As chemist, Van Helmont holds a distinguished rank. Many curious experiments, and even many discoveries that have contributed to the recent advancement of the science, entitle him to the everlasting gratitude and esteem of those who can duly appreciate his labours. It is to him, that we are indebted for our first knowledge of the properties of aëriform fluids; and it was he, who applied to them the name of *gas*, by which they still continue to be distinguished.

SECTION XII.

Of Sydenham.

WHEN Sydenham appeared in England, the science of physic still retained its scholastic form. The progress of the other branches of knowledge had hitherto exerted only a prejudicial influence upon it; and the genuine spirit of observation was almost entirely unknown. Sydenham, after a short course of study, assisted by a little reading, but guided chiefly by the impulse of a happy genius, undertook to bring back the practice of the art to the path of experience. With the prevailing theories of the time he was but imperfectly

imperfectly acquainted; but this circumstance was, perhaps, more favourable to his labours, as it could never be embarrassing to his self-love, and as he would find the less difficulty in following the footsteps of Nature. Among the number of his friends was the illustrious Locke, to whom we are indebted, if not for the first principles of a philosophical method of inquiry, at least, for the first demonstration of the fundamental truths on which they are founded. The friendship of such a man sufficiently indicates the disposition of mind of the person who cultivates it, and serves, as it were, for its standard of comparison. We can, therefore, scarcely doubt, that the counsels of the philosopher must have greatly contributed to the success of the physician, who, indeed, acknowledges it himself with candour*.

Sydenham attacked, with the irresistible arms of experience, several destructive prejudices, which at that time prevailed. The chemists, for instance, had introduced into medicine the indiscriminate use of cordials, and of ardent or volatile spirits. In acute diseases, in particular, the abuse of these remedies was very great. Sydenham proved, that, in such cases, they were almost al-

* In his *Treatise on Acute Diseases*, he mentions, as a proof of the excellence of his method, the circumstance of its having received the approbation of his illustrious friend.

ways injurious, but especially at the commencement of the disorder. The small pox, and other acute cutaneous eruptions were treated by sudorifics alone. Sydenham demonstrated, that this mode of practice had been more fatal to mankind, than a long succession of destructive wars. His *Treatise on the Gout* has been generally regarded as a master-piece of description: it is, indeed, the most perfect account of this disease which we possess; not, that this malady always presents itself in the manner in which it is described, but because we can conceive nothing more accurate or ingenious, than the plan of observation which he there lays down.

Hippocrates, in his *Epidemics*, had sketched the outlines of a system of physic, as extensive as it was original: (I allude to his treatment of epidemical disorders). During several ages, his ideas had remained, in a manner, dormant. Baillou, a Parisian professor, in the 16th century, appropriated them to himself, and extended them; not, indeed, as a man of genius, for he was not such, but, at least, as an attentive observer and skilful practitioner. He was even led to consider them in several new points of view.

Sydenham, without having any knowledge of Baillou, perhaps, even without having read Hippocrates, was led into the same path by observation alone. He pursued it with still greater success,

cess; and in this his chief glory consists. It is only since his time, that we have become thoroughly acquainted with those general variations to which the characters of epidemic diseases are liable; with the relations they bear to each other, and their connection with the different apparent changes of the atmosphere, or their independence of these changes, which is often very apparent; with the influence they exert upon sporadic or local disorders; and, lastly, with the manner in which their succession is regulated, although the order of it, we must confess, has not yet been subjected to any determinate rules, upon which we can entirely rely.

The practice of Sydenham effected a real revolution in physic. It was the triumph, not of a transcendent genius, who reforms every thing by bold and general views, but that of an observer, who investigates with sagacity, who conducts his researches with skill, and who is always guided by a sure method. The theories of Sydenham were, it must be acknowledged, contracted, or even erroneous; and beyond the sphere of his experience, in which his natural penetration supplied the place of all other talents, his ideas were, in general, very limited; but no physician ever exerted so beneficial an influence on that branch of the art, to which all the others are subservient—on its practical application: and in this respect,

no one was ever more deserving of the title of restorer of true medical science.

SECTION XIII.

Discovery of the Circulation of the Blood.

THE genius of Bacon and Descartes had powerfully aided the progress of the human mind. Descartes, in particular, attracted the attention of Europe, by the novelty of his ideas; for Bacon was not thoroughly understood till a much later period. The rational scepticism and novel methods, that were employed in the research of truth, promised to change the whole face of intellectual philosophy. The application of algebra to the geometry of curves, and a system of astronomy, which explained all the phenomena, by the laws of motion, might be expected to operate the same revolution in physical science. The latter, accordingly, was cultivated with greater attention. The experimental path, which had been so highly extolled by Bacon, became generally introduced by Galilei, his cotemporary, and the disciples of the Florentine Academy, whose researches were guided by the most regular and accurate methods. Finally, the geometry;

metry of fluxions, which had been hinted at, and even pointed out, by Fernal, Descartes, Pascal, and some others, was soon after invented by Leibnitz and Newton*. It opened a new career for genius, and furnished it with the means of pursuing it. It gave reason to entertain hopes of many further discoveries, which, before, it must have appeared absurd to attempt. This new instrument, compared with those which mankind had hitherto possessed, was, to use an expression of Leibnitz, like the club of Hercules, compared with the feeble arms of a mortal warrior.

Amid this general impulse, that had been communicated to science, medicine did not remain stationary. A circumstance, which I should have before noticed, had prepared it for all kinds of innovations, by again subverting the authority of the ancients, whose physiological errors it completely exposed: I allude to the circulation of the blood, which had been obscurely hinted at by the unfortunate Servet; more clearly hit upon, if I may so express myself, by Varolius and Columbus; described with accuracy, and even in sufficient detail, with respect to the heart and larger vessels, by Cæsalpinus; but of which the complete demonstration is due to the labours of

* It appears to be now ascertained, that the merit of this discovery is to be exclusively ascribed to Newton.

Harvey, to whom the merit of it is now exclusively attributed.

The new light which was thrown upon the animal economy, by this important discovery, served only, we may affirm, to redouble the rage of systems. Nothing else was thought of, but to cause the blood to circulate more freely, to destroy its viscosity, to draw off from the body that which was supposed to be corrupted, to purify it, correct it and renew it, and to preserve the blood-vessels in a relaxed and pervious state. Hence those torrents of aqueous and diluent drinks, with which Bontekoe and his adherents, inundated their patients. Hence that sanguinary fury, which the partisans of Botalli thought themselves entitled to exercise, in their treatment of all sorts of diseases;—a fury, which, though so often damped, in some measure, by systematic murders, has ceased only for intervals, and still, from time to time, reappears in the schools. Hence, too, that wretched mania of the transfusion of blood, of which the practice almost always deprived those who had the temerity to subject themselves to so dangerous an operation, of their life, or their reason.

Thus, one of the most beautiful discoveries of modern medicine, far from elucidating the practice of the art, as there was every reason to expect, only had the effect of misleading weak imaginations,

imagination, dazzled by its splendour: and it may still be doubted, whether its application to the knowledge and cure of internal diseases has been of any real use. In surgical cases, even, where its assistance is generally regarded as indispensable, might not observation almost always supply its place? And must not we limit its importance to the elucidation of a point in anatomy and physiology, very curious, no doubt, in itself; but which, if it did not indirectly affect many other interesting questions relative to the animal economy, would, perhaps, have contributed very little to our knowledge of its true laws?

However, under this point of view alone, the discovery of the circulation has been productive of advantages by which the practice of medicine has eventually profited; and the glory of its authors can be contested only by the most ridiculous envy, or the most inconsiderate attachment to paradox.

We have seen the science of medicine subjected successively to the opinions of Heraclitus, Pythagoras, Epicurus, Aristotle, &c. When the philosophy of Descartes, after having been arraigned for its impiety, came by degrees into vogue, and was transformed even into a species of superstition; medicine was carried along by the general current of opinion, and became Cartesian.

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The chemical theories of acids and alkalies, which were applied to the fluids of the living body; the pure mathematical theories, by means of which men, who were, in general, of inferior talents, both as physicians and geometers, pretended to explain the functions of the different organs of the body; the hydraulic theories that succeeded, and which served as the foundation of so many erroneous calculations with regard to the circulation of the blood and other fluids; and lastly, the mechanical views that were broached, respecting the general laws of motion, and their influence on the phenomena of life, or respecting the advantages which may be derived from an acquaintance with them in the illustration of these phenomena;—all began to attract very general attention, when there appeared a new professor, who was destined to effect a real revolution in the science.

SECTION XIV.

Of Boerhaave.

THE early part of Boerhaave's youth had not been spent in the study of physic. Designed, at first, for the church, but afterwards captivated with

with a taste for the mathematical and natural sciences, upon which he employed himself, for some time, in giving lectures, in order to earn a livelihood, it was not till he was pretty far advanced in life, and after he had acquired a thorough and extensive acquaintance with all the subjects of his early studies, that he commenced his medical career. His mind had already been greatly improved in point of strength and comprehensiveness, and he had acquired a habit of rigorous discussion and patient research. But his talent of discernment, exercised, as it was, upon subjects altogether new, and at a period of life when the impressions of external objects begin to be weakened, in consequence of a certain diminution of the sensibility, or become more confused, in consequence merely of their variety; under these circumstances, his talent of discernment never, perhaps, attained that degree of perfection, which, at the bedside of the patient, can alone render the gifts of knowledge and the powers of reason productive of real utility. Besides, how could he be expected to renounce the natural desire of applying his more recent acquirements to those which he formerly possessed? Imbued, as he was, with the scholastic learning of the times, how could he have banished entirely from his labours the use of forms, methods, and hypothesis? Relying with confidence on the sure and rigid operations of geometry,

geometry, how natural was it for him, sometimes to wish to introduce them into a science which it is so highly desirable to free from its unsteady, and too often uncertain character !

We have above remarked, that Boerhaave was possessed of great and extensive knowledge, and was desirous to apply it to all his systems of physic. He had perused the writers of all sects, and of all ages: he had analysed, illustrated, and commented upon their works. With all their labours he was acquainted: all their opinions were familiar to him. He appropriated them to himself; he modified and combined them, and imparted to the whole that luminous order for which he is so much distinguished. He soon gave to the world his Institutions of Medicine and his Aphorisms, two of the most concise, and at the same time comprehensive, works that science had yet produced; and which, for variety of matter and extent of views, had been surpassed only by those of the illustrious Bacon. Happy would it have been for chemistry, which is indebted to him for some very important discoveries, if the imaginary notions of various acrimonies and their neutralizations; and if the introduction of pure mechanical and hydraulic theories had not so often disfigured such useful labours. Fortunate, too, would it have been, if, in his descriptions, he had adhered more closely to the natural order of the formation

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tion of ideas, and had begun by collecting and classing facts and data, in place of always commencing with the conclusions. Then might the writings of this extraordinary man have served as models of the true methods of reasoning and of teaching, as they are unquestionably masterpieces of erudition, of criticism, of order, perspicuity, and precision.

Boerhaave published several separate works on various branches of medicine, in all which the same vigour of mind is conspicuous. His *Prellections on the Diseases of the Nerves*, his *Consultations*, and his *Letter to De Gorter*, shew that Boerhaave, at a more advanced period of life, and after having exercised himself in the observation of nature at the bedside of the patient, attached much less importance to his systems, and that he was gradually approaching nearer to the ideas of Hippocrates, and of all sound physicians. But the two works I have formerly mentioned, contain the substance of his doctrines, and, as they were designed for textbooks to his lectures, they give a very complete idea of his plan of instruction.

The medical school of Leyden, which boasted of many able professors, at the time that Boerhaave became a member of it, is now no longer celebrated but for having produced him: Its fame is, as it were, eclipsed by his renown. After having

having remained, during his lifetime, at the head of the medical world in Europe, his name, for a long time after his death, preserved the same degree of lustre. The talents of his disciples, dispersed over all the countries of the world, have procured it both admiration and respect: and, doubtless, a name so deservedly illustrious, will be transmitted to the latest posterity, not, perhaps, as that of a real and transcendent philosophical genius, but as that of a very able and laborious teacher, and as that of a very elegant writer.

SECTION XV.

Of Hoffmann and Baglivi; of the new Solidists of Edinburgh; and of the School of Montpellier.

ABOUT the same time, Hoffmann, professor in the University of Halle, grounded his practice and theory upon a new system, which has received the name of *Solidism*. It was the old Methodical doctrine*, modified by the opinions of Hippocrates, and by the modern discoveries in chemistry and philosophy.

* Prosper Alpini had before made an attempt to revive it.

The eloquent Baglivi, of whom science was deprived by a premature death, had sketched the outlines of this system, in his course of lectures at Rome, the celebrity of which attracted pupils from all parts of Europe, and also in his treatise *De Fibra motrice et morbofa*.

These two physicians*, then, rejecting or limiting the opinions of the Humoral Pathologists, according to whom the fluids exercise a direct and essential influence upon the healthy and morbid states of the system, restored this important office to the solids. They endeavoured to show, that the changes in the state of the fluids, are merely the consequences and necessary effects of the changes which the solids experience. In short, according to their hypothesis, the operations of life, and all its revolutions, are effected in the *solid* parts of the system, which, from this view of the subject, Hoffmann termed *solidum vivens*. The Solidists, however, are distinguished from the Methodic sect in this respect, that the former, along with Hippocrates, acknowledge the existence of a vital principle, the laws of which can be known only from the observation of the phenomena peculiar to living bodies; and these phenomena themselves, according to them, result from the agency of this principle upon the fibres,

* Hoffmann, in his opinions, approaches nearer to Baglivi, than to Prosper Alpini.

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among which nature is supposed to have distributed it, for the purpose of animating them all with a certain portion of energy and activity.

The principles of Hoffmann are found scattered through his extremely voluminous works, which, however, display much learning, and contain many good practical remarks. He has abridged them, and delivered them along with all their illustrations, in his last performance, intitled, *Medicina Rationalis Systematica*.

These principles seem to have given birth to those now taught in the Edinburgh School;—a school justly celebrated for a rare assemblage and uninterrupted succession of distinguished professors in many different branches of learning.

The name of *Animists* had been applied to the immediate followers of Stahl, such as Alberti, Juncker, Nenter, &c. Those, who have since combined his views with the doctrines of the Solidists, and Chemical or even Mechanical physiologists, such as De Gorter, Gaubius, Sauvage, and Robert Whytt, have received the name of *Semi-Animists*.

To conclude; from the opinions of Stahl and Van Helmont, and of the sect of Solidists, extended, modified, and corrected, as they were, arose a new system, on which Borden, Venel, Lamure, and, we may venture to say, almost the

the whole school of Montpellier, have conferred great lustre and renown. This system, enlarged, as it has been, since the time of these celebrated professors, by the extensive labours of Barthez; supported by his pupils and successors with all the additional proofs which modern discoveries and the progress of the collateral sciences could furnish; improved by the application of philosophical methods, which men of genius now begin to introduce into all the branches of our science, —this system appears to be gradually approaching nearer to the truth. It will probably soon cease to be regarded as a particular doctrine: and, by taking advantage of the real discoveries that are to be found scattered among the different sects; by divesting itself of that jealous spirit which extinguishes real emulation, and which has engendered nothing but ridiculous disputes; it will probably become the only incontrovertible theory in medicine; as it will form the natural and necessary link between all the particulars of medical knowledge that have been collected, down to the present time.

SECTION XVI.

Of the present State of Medical Education.

IN every age the schools have allowed themselves to be more or less guided by the prevailing systems ; which was so far proper. But, by a singular fatality, they have, almost without exception, participated in all their errors, without deriving much advantage from the new truths which had commonly furnished the first hints of these systems, or from the useful views, which the most absurd of them might still suggest to intelligent minds. The errors, in general, were more easily combined with received opinions, and, accordingly, were most readily adopted. Every thing, which was but remotely allied to these doctrines, made less impression upon understandings that were already preoccupied, and was therefore rejected, or suffered to lie in neglect. The education of youth, which, from the revival of learning, had been intrusted to bodies of men, slow in their proceedings, and obstinate in their tenets, and who, besides, either from vanity or policy, felt themselves interested in opposing the introduction of all new ideas, consequently seldom kept pace with the progress of public opinion. Among the Arabians, the universities were
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placed in the hands of a particular class of men, who, though they did not, as among us, belong to the Sacerdotal order, yet formed, in reality, a distinct corporate body, the conduct and opinions of which were governed by a certain spirit, that was pretty uniform in its nature and operation. Among the Greeks, it is true, the philosophers presided over the schools; but, perhaps, in no other nation has the sectarian spirit been pushed to the same degree of excess: and however perfect the ancient schools of medicine may have been, their success, in general, depended much more upon the capacity of the masters, and much less upon the character of the establishment, than those of modern times. It was therefore natural, that they should experience more frequent and entire revolutions. Besides, too, many branches of human knowledge, necessarily connected with medicine, were still in their infancy; and that happy constitution of the literary world, which makes the advances of each part conspire to the progress of the whole, did not yet exist.

Perhaps, it may be necessary to add one further remark, (but a remark applicable to all ages of the world) viz. that the most able professors have not always shewn themselves the best observers, or the men of most comprehensive minds. For, it must be confessed, the allegation is not altogether unfounded, that those situations,

for which a facility of speech may become in itself a principal recommendation, ruin more understandings than they are capable of forming. A man soon becomes intóxicated with the successes of the professorial chair, as well as with those of the rostrum : and, if it be no easy matter to avoid being prepossessed in favour of opinions, which we have delivered so often with applause ; it is, perhaps, still more difficult to resist the temptation to reject all ideas that tend to contradict these opinions, and to endeavour to pervert from their natural meaning, the facts that appear capable of disturbing the tranquil enjoyment of certain prejudices, for which we have long contended.

In the school of Cos, or rather in the school of Hippocrates, medicine was taught according to the best principles. A true philosophical spirit, and not a blind adherence to system, directed its plan of instruction. Observation, experience, the due culture of the senses, and the method of induction, were its foundations. We have already seen, that the pupils of this school were constantly surrounded with the objects of their future labours ; with books *, instruments, medicines, and, in particular, with patients, without the inspection

* From a passage of Xenophon we learn, that, even at that time, there existed a considerable number of books. *Vid. Memorabilia.*

of whom it is astonishing, that some nations, sufficiently enlightened in other respects, have for so long thought it possible to educate physicians.

But in the age of Hippocrates, and for many centuries after his time, the science of anatomy remained in a state of infancy; and the anatomy of the human body, in particular, was scarcely known. The art of surgery afforded no fixed rules for several of the most important operations. The *materia medica* was confined to a few remedies of great efficacy, but too violent to be used in common practice, without danger. The art of pharmacy could not be said to exist. Finally, mineralogy, chemistry, mechanical philosophy, and all the branches of natural science, which have a more or less intimate connection with the art of medicine, had scarcely acquired their elementary principles, or were obscured and lost in false and ridiculous theories.

This period, then, could not be expected to produce a perfect plan of instruction: although that which was adopted, appears to have been, otherwise, extremely well contrived. It is solely with regard to the manner of viewing the living system, and of observing and describing the phenomena of disease, that the Hippocratic school has left us models worthy of imitation.

I shall pass over a long space of time, during which the condition of the schools can suggest no

very pleasing reflections to the inquirer, and in which the state of education presents nothing but a scene of confusion.

At the end of the sixteenth, and in the seventeenth century, the advancement of science was great and rapid; while the system of instruction made little or no progress. During this period, in particular, we perceive a wide difference between the doctrines contained in the best books, and those of the schools; between the prudent advances, the more steady and exact proceedings, and the more independent tone, of the authors of the time, and the blind routine, the scholastic jargon, and the mean and servile prejudices, of by far the greater part of the teachers*.

It is in the eighteenth century, that the system of instruction has made real progress. To the jargon of the schools has succeeded a language more pure and more precise. The improvement of mathematical methods; the employment of more accurate means of investigation in physics and natural history; that philosophical spirit, which, by degrees, has become universal; that refinement and taste, which the numerous master-pieces in literature and the arts have rendered a sort of want for the polished class of society in

* The Jesuits rendered great services in this respect; but the Society of Port Royal gave the first example of a philosophical method of instruction.

all nations; have at length compelled the schools to cast off their barbarous rubbish. Reason surrounded them, and assailed them on all sides: and even took possession of their benches. Justice is now done them. They have long bravely combated against common sense; and we may even perceive, that their impotent remains would be ready to renew the contest: but reason has conquered; folly has been overthrown, and, in spite of all its efforts to rise again, must for ever remain so. The duration and the obstinacy of this shameful conflict are precisely the circumstances that preclude the possibility of a return to ancient methods, and, above all, to ancient errors; in favour of which latter alone the former are of value, in the estimation of a certain description of people. Doubtless, those men, who are the firm and faithful votaries of truth, will, in all ages, be attacked by ignorance, and persecuted by hypocrisy: but the triumph of their cause is henceforth secured. Many parts of human knowledge have attained a sort of perfection; a rich store of materials is collected for others: it only remains for us to apply the true methods of research to all equally; and, above all, to apply them with equal strictness to all the branches of instruction.

But, if it be the peculiar business of the philosopher to trace these methods, it can belong

only to the legislator to transfuse the spirit of them into the organization of the public seminaries of education.

There are, no doubt, many employments, which the government should content itself with merely protecting. When private interest is sufficiently cogent, every thing should be left to it; for the interference of public authority tends, for the most part, only to stint and distort its operation. Thus, many great and splendid undertakings, from which a whole nation derives advantage, are much better executed, when the legislature takes no concern in them: and institutions, in a manner, above the power of sovereigns themselves, are easily accomplished, by the union and concurrence of the individuals interested in them.

We may reasonably entertain hopes, that this will one day be the case with education. Knowledge will, in all probability, become so indispensably necessary to the existence and happiness of mankind, that they will be induced to search for it every where with eagerness. From that moment, it will become a branch of industry, equally honourable and profitable to those who are capable of exercising it: from that moment, governments may rely upon this reciprocity of interests, as tending to secure both the advancement of science, and the progressive improvement of public opinion.

But

But in the present state of affairs, when it is so necessary to stop the progress of rapine, of folly, and of madness, which are reappearing in such a variety of shapes; when quackery, ever ready to take advantage of the wavering state of opinion, should be checked with more vigilance than ever, by the laws, at the same time that it is exposed in all its deformity by science; and when the place of ancient errors is as yet but imperfectly filled by well ascertained truths;—at such a time, it is doubtless incumbent upon government to point out the proper objects of study, and to give the first impulse to public opinion. It is incumbent upon it to establish the course of instruction on a plan conformable to the legislative system of the country, in order that they may mutually second each other, while they are gradually corrected and improved. And it is, moreover, incumbent upon it, to lend every possible assistance to physicians of genius and skill, in order to enable them to effect the complete reform of their art, which, from its nature, requires both more vigilant superintendence, and more powerful encouragement*.

* The Government of the Republic has greatly contributed to the promotion of this object, by organizing the present Schools of Medicine, and, in particular, those of Paris and Montpellier.

CHAPTER III.

General Views on the Subject of Medical Education.

SECTION I.

Of the Faculties of Man; of the Sources of his Errors; and of the Invention of Philosophical Methods.

MAN, from the nature of his organization, is endowed not only with the faculty of sensation, and the power of transforming his sensations into conceptions, and of deducing from the latter a series of judgments and moral perceptions; but also with the faculty of participating in the ideas and sentiments of others, of appropriating to himself those which are communicated to him, and of imitating and repeating the actions which he witnesses, or which he learns from testimony. He is enabled to take advantage of the labours of his predecessors, as well as of those of his contemporaries—to command the experience of ages: and if the means of communication with his fellow-creatures were sufficiently perfect, he might be said to live in past, present, and future time,
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and to coexist, as it were, with the whole human race.

It is by means of the senses with which nature has furnished him, or, rather, that sensibility, which renders all his organs subservient to the energy of his brain, that man becomes acquainted with external objects. His sensations are the immediate sources of his knowledge, and the organs of his body, in as far as they are endowed with sensibility, the direct instruments of his instruction. But urged, as he is, by his wants, and by that eager curiosity, which continually incites him to exertion, man, at least in a social state, soon begins to form to himself other instruments, the artificial products of repeated trials and studies, which tend to augment considerably the energy or activity of his organs. These new instruments of power are sometimes directly applied to the organs of sense; at other times, they serve to enlarge and facilitate the operations of the understanding; and they even appear, at times, to unfold faculties equally new with themselves. All these different instruments are capable of being improved by culture, experience, and reflection, and, upon their gradual amelioration, the progressive improvement of the whole human race depends.

In their natural order, the impressions which we receive are, no doubt, just and conformable to
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to the manner in which we ought to feel. For, if they were not, no efforts of art could ever render them so. The ideas which they generate ought therefore to have the same character of justness, when nothing extraneous occurs to corrupt them, either in their original source, or in the series of organic operations that conspire to produce them. Thus, it appears, man naturally thinks and reasons justly.

Sad experience, however, teaches us, that error is more familiar to him than truth. In all countries, and in all ages, we find him eagerly grasping at chimeras: every where, he appears to be the sport of the most degrading prejudices, which he cultivates and cherishes, and often deifies and adores. And since it cannot be denied, that this fatal disposition is common to the whole species, we must conclude, that the original cause of it exists also in nature.

The chief distinction between man and other animals consists in his superior sensibility, or the faculty of receiving a greater variety of sensations, and more lively sensations, than they are capable of procuring. Now, lively sensations occasion prompt decisions; and a multiplicity of sensations are distinguished and examined with difficulty. In these circumstances, therefore, the operations of reflection are liable to become nothing but false conclusions from facts.

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In all those cases, it is true, in which punishment immediately follows error, the latter cannot be of any long duration. The custom of forming erroneous judgements is, in this case, accompanied by a series of painful feelings; and the first of all wants leads us, of course, to shun the causes on which they depend. In this way, then, every one learns to correct for himself these false judgments. But the objects, to which this observation is applicable, are confined within a very narrow sphere in the social state: they almost all relate to direct and natural wants, which form but a small part of the relations that unite man and man, and abridge the empire of folly in a very limited degree.

In general, it would require much time and tranquillity to examine, with due attention, the motives of the opinions we adopt, or of the line of conduct we are led to pursue. But the circumstances that incite us to action are, in general, urgent, and oblige us to decide without delay. The necessity of coming to a prompt determination, therefore, is a fruitful source of error, and it is frequently mistaken for a false instinct, or produces habits of precipitancy, which give it that appearance, even in cases where there would be sufficient time for reflection.

Strong impressions may also take possession of the judgement, and may disfigure the objects, or
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at least prevent us from examining them in all their different lights. In fine, a vicious habit of feeling and judging, contracted by imitation; and the still more common and vicious habit of affixing to our own ideas, or to the ideas of others, signs which are neither uniform nor well determined; both these habits tend to encrease the difficulty of completely avoiding error: and all these causes, no doubt, depend, in a more or less immediate manner, upon the very nature of our faculties, and the relations that subsist between us and the objects of our judgments.

Hence it comes, that man, formed as he is, for reasoning always justly, reasons almost always wrong. Hence it comes, that the same order of things, which renders truth necessary to him, and which points out its course, surrounds him at the same time, with snares and false indications; and, in this way, those very qualities, which should enable him to discover and to recognise it, are apt to become the sources of a number of gross errors, which constitute, as it were, his ordinary condition, to which good sense forms, in some measure, but an exception.

The art of regulating the human mind becomes, therefore, necessarily the subject of a laborious study: it is an art, the theory of which demands all the powers of attention, and the practice of which requires all the cautions of ex-

perience. We must learn, not only to combine, to reflect, and to conclude; but we must also learn to see, to hear, to touch, or in a word, to feel.

Scarcely had philosophers begun to observe the external world and themselves, when they perceived, both what we might become, and what we were not. They endeavoured to discover the causes of our errors and their remedy: but, as this cause was still operating upon themselves, at the very moment they were engaged in opposing it, the remedy consequently became more difficult of discovery. However, each framed his hypothesis; each delivered his system. But the number of those who have taught us how to direct successfully the operations of our understanding is very limited; and their labours have left much to desire.

Hippocrates, Aristotle, and Epicurus appear to have been the only persons, among the ancients, who were fully aware, that, in this species of research, it is necessary to begin by the observation of what passes in our mind when we feel and judge; because they alone had perceived distinctly, that our sensations supply the materials of our judgments. But of the opinions of Hippocrates and Epicurus, on this point, no systematic exposition remains; and although Aristotle has left us an ingenious analysis of the reasoning powers,

powers, we may reduce all the true and useful matter which his ideological writings contain, to the celebrated axiom, so often quoted, but which, in no part of his works, is to be found stated in precise terms.

From Aristotle to the time of Bacon, no real improvement took place in philosophical methods: and error, reduced to a kind of system, became every day more difficult to eradicate.

Bacon, taking a rapid survey of all the branches of science, perceived the source of the vain conjectures which disfigured them, and of the false doctrines with which they were encumbered. Not satisfied with tracing the plan of their reform, he endeavoured to remould the instrument by which we acquire our knowledge: with him the restoration of true philosophy may be justly said to commence.

Since that time, the progress of science has been rapid. Hobbes, Locke, Bonnet, and Condillac have successively improved upon the views of Bacon*, and have rendered the processes of philosophical analysis more simple and more sure: they have, in particular, established the rules for its employment, upon a more accurate knowledge of the faculties and operations of the human mind†.

These

* See note [I].

† I refrain from mentioning, in this place, the successors of Condillac, several of whom appear to me to have added to the

These faculties and operations, described and investigated, as they have been, with an extraordinary degree of minuteness, exhibit, in what may be called the natural history of the understanding, a model of the true method of research,—of the only one applicable to all the branches of science. For it is by this method that we are enabled to observe accurately the objects of our researches, to acquire clear and exact ideas of their properties, to class them and connect them in systems that do not deserve the name of conjectural: it is by its aid, that we are enabled to study, teach, and communicate these systems: and, lastly, it is this method which not only simplifies and facilitates the acquirement of knowledge, in the greatest degree, but also, by presenting the particulars of which it is composed in their most natural order, impresses them firmly on the memory, and gives us a ready command over them.

the precision of the Analytical Method, and, perhaps, even to have opened new channels for its employment, and to have established its principles upon a more solid foundation: but they are still living; and time alone can decide upon the merit of their labours.

SECTION II.

Application of the Analytical Method to the Art of Medicine.

To return to medicine:—we shall find that with respect to it the employment of the true method of research will not prove less fruitful in useful results.

Man, like other animals, is susceptible of painful as well as agreeable impressions. He is even much more susceptible of both, than any other known description of beings. Of this the reason is sufficiently simple. His sensations proceed from a greater variety of objects; and his imagination, the activity of which they augment, reacts, in its turn, upon his sensations, and imparts to them a greater degree of energy, or causes them to assume new and unusual directions.

Painful sensations constitute disease, in the same way that pleasurable feelings constitute the state of health and well-being.

It is easy to perceive, that the moral sufferings and the happiness of man depend more or less immediately upon these two physical states; that they are, to speak correctly, nothing but these two states themselves, considered in different points of view, or in relation to particular circumstances.

cumstances.—But to enlarge on this point would be foreign to our present purpose.

A painful sensation cannot be regarded as a disease. When it is transient, nature remedies it herself, and the remembrance of it is very soon effaced. If pain or uneasiness, however, is prolonged, then it becomes a real disease. In this case, however, nature does not remain inactive; but adjusts in secret a variety of new actions, which, for the most part, are directed towards the re-establishment of health. At the same time, an internal and powerful monitor leads man to seek for aid among external objects: and having learnt from experience, that several of these objects may effectually remove his various wants, he makes trial of them successively, in all those cases, in which the suggestions of this monitor are heard.

All our sensations may, no doubt, be comprised under the two general heads of *pleasure* and of *pain*; but they are, nevertheless, varied, as it were, to infinity, or, to as great an extent as the objects themselves which produce them: For external objects act upon animated bodies in many various ways; and the more or less permanent consequences that follow their operation are as various as the immediate sensations they occasion.

This observation must occur to the mind as soon as we begin to look around us: the importance and frequent repetition of the lesson prevent it from ever being forgotten.

It often happens, however, that there is no relation between the immediate sensation and the permanent effect it produces. The thing that pleases, may prove injurious: the thing that displeases, may become beneficial.—Another observation, which is not quite so obvious as the former.

To conclude; certain objects do not, at first, cause any particular sensation, and appear to have no very distinct effect; yet we find, that, afterwards, either by recollection, or by a long continued habit, they produce very important consequences.—A third remark, which we make much later; which is confirmed only by a great number of examples, and which, consequently, has no influence upon the conduct of man till after the errors he is continually committing, from inattention to it, have become the source of reiterated painful sensations.

Before arriving at this degree of knowledge, man must be supposed to have collected many particulars respecting the diversity of the causes that are capable of producing in him the feeling of uneasiness, and of those that tend to alleviate or remove it. The mere desire of avoiding painful or disagreeable sensations, would induce him to make a variety of exertions; and, from these repeated exertions, would arise a system of observations, at first, no doubt, very imperfect, but more or less calculated for the use of families, communities, and nations.

Fortunate

Fortunate accidents, the example of other animals, the appetites of persons in a state of disease, would all serve to augment, by degrees, this original stock of knowledge. Experiments would be quickly multiplied; and by this increase in their number alone, they would become more bold, rational, and applicable to our daily wants.

Condillac has remarked, that men naturally analyse; that is, that they naturally observe, compare, and judge correctly. Nothing can be more true: but it is only with reference to simple objects,—to objects which may be viewed in all their different lights at once, that the observation is altogether just;—with reference to facts the mutual relations, or identity of which are easily recognised;—and with reference to fixed, or nearly invariable data, that are limited in their number, and equally easy to collect, to determine, and to compare in every point of view.

Unfortunately, these favourable circumstances do not attend the study of several subjects, that form an important part of our knowledge. The objects, for example, to which medicine and moral philosophy are directed, present many serious difficulties. The sciences of medicine and ethics, accordingly, must remain much longer in a state of infancy; or at least their principles must, of necessity, be longer in acquiring that evidence and solidity, without which they can scarcely be regarded, by exact

minds, as forming real bodies of science. On the other hand, those branches of research that aim at the determination of the most simple and invariable properties of bodies, as, for instance, the properties of numbers or extension, will, in the hands of men of talents, make very rapid advances, of which the human mind may justly boast, and of which, at every new step, it may verify the certainty, and even duly appreciate the importance.

In proportion as the particulars of our knowledge are augmented, it becomes more necessary to class them and distinguish them. Classifications are, indeed, absolutely necessary for assisting the memory, and for regulating the operations of the mind. If they were limited to this object, they would invariably be productive of benefit. But men are too often led to imagine, that nature should subject herself to the order they prescribe to her; and presumptuously deduce practical rules for all possible cases, from this order, which, for the most part, has no existence but in their own imaginations.

In this way, methods of arrangement become a new source of confusion: in this way, the mind, deviating from the true path of research, substitutes, in the place of real objects, its own fictions and chimeras; in this way, the abstract notions it acquires (which, of course, must be very inaccurate, since their elements are liable
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to be changed upon every fresh application) become the basis of judgments and practical rules, probably, of the highest importance;—and frequently, these judgments and practical rules have no just foundation whatever.

SECTION III.

Of the Difficulties that oppose the Application of the Analytical Method to the Observation and Treatment of Diseases.

AMONG the various subjects, which man, from his wants, is obliged to study with attention and assiduity, there are few that combine, in the same degree, as medicine, all the difficulties attendant on that unsettled and variable character we have been describing; and there are few, in which the rash and inconsiderate employment of generalization may be attended with more serious disadvantages.

To give an example: we soon learn from observation, that the symptoms of pain of side, cough, spitting of blood, accompanied with fever often occur together. We, consequently, soon accustom ourselves to regard this assemblage of symp-

toms as a particular affection, and apply to it the name of *pleurisy*;—a name taken from the pain of side, which being always felt by the patient, becomes, of course, to him the predominant symptom.

In many cases, in which these different phenomena take place, they are relieved by profuse natural hemorrhages—and artificial evacuations of blood produce the same effect. The patients, suffering much from thirst, feel a desire for mild and diluent drinks: these drinks occasion gentle sweats, and the latter contribute also towards recovery. Expectoration now takes place; and this discharge, too, may be promoted by other deobstruent drinks. Finally, after a more or less evident effort of nature, the symptoms altogether disappear, and health is re-established.

In the list of remedies corresponding to the catalogue of diseases, opposite to the word *Pleurisy*, we accordingly find, in the first place, *blood-letting*, *diluent drinks*;—next, *deobstruent* and *expectorating remedies*;—and, lastly, *gentle sudorifics*.

It is evident, that in this instance I adopt the most favourable supposition—that, in which the symptoms are well characterized, and in which the effects of the medicines are striking and easily distinguished. Thus, we are supplied with an axiom, or rule of practice; the deduction of which shews us in what manner all the other rules may be

be obtained, in those cases where their formation is conducted upon sure principles, and on a proper plan.

Supposing the symptoms expressed by the abstract term *pleurisy* to occur by themselves; and the nature of the curative means, and the time and order of their administration to have been accurately observed; in such a case, the word *pleurisy* certainly denotes nothing more or less than the character of the disease; and the success of the remedies employed may be confirmed by a sufficient number of examples. In this case I repeat, the rules that are laid down for the employment of these remedies, are, in reality, deduced from facts, and obtained by the sure method of induction.

But, in other cases, to which we also apply the word *pleurisy*, on account of the presence of the principal phenomena, expressed by this generic term, bloodletting is found to be injurious; diluent drinks augment the disease; deobstruent medicines either exhaust the strength, or produce absolutely no effect; while, on the other hand, it happens, that, sometimes, copious vomitings, occurring spontaneously or produced by art, anthelmintic remedies administered in more or less inconsiderable doses; at other times, the speedy employment of cathartics and diaphoretics; at other times, again, the application of vesicatories, &c. remove, either
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instantaneously, and, as it were, by enchantment, or moderate by degrees, and by a succession of partial crises, the lancinating pain of side, the cough, hemoptysis, &c.

These cases, so different from each other, since they can be cured only by different modes of treatment, are, it is true, characterized by certain accessory symptoms by which we may immediately distinguish them; or by particular circumstances from which we may indirectly deduce their existence. But before they had been recognised, described and distinguished by attentive observers, they remained for a long time confounded together under the deceitful disguise of a common name.

SECTION IV.

The same Difficulties and Dangers occur in the Classification of Remedies.

IF we proceed to the classification of remedies, we shall often meet with the same obstacles: and these obstacles will be found to depend upon the same causes.

One remedy, for instance, promotes perspiration; we, accordingly, place it in the class of *Sudorifics*:—another removes the suppression of the menses; and we, consequently, rank it among the

the *Emmenagogues*. These properties, which, from imperfect trials, have been ascribed to them, and in the determination of which so little regard is, in general, paid to the particular circumstances of the case, and the circumstances in which the remedy has been administered, are often completely illusory; unless, indeed, we have the good fortune to employ these remedies in cases precisely the same in all respects, as those that furnished the original observations. We, also, very soon perceive, that the remedies we call *sudorifics* may impede or suppress perspiration; that those which we qualify with the term *emmenagogues* may often increase the spasm or inactivity of the uterus, and aggravate the disease they were deemed capable of curing.

The same must be acknowledged with regard to all remedies that possess specific properties. Of these, there are none, which, according to the cases they are employed in, may not produce absolutely contrary, or, at least, widely different effects.

If we look into the books of *materia medica*, we shall find many remedies ranged successively in almost all the different classes of medicines; whence we might be led to believe that they all produce the same effects: And, as the traces of the original observations that occasioned these contradictory qualities to be ascribed to them, are, for the most part,

part, entirely lost, it is only by dint of labour and research, that we are able to extricate ourselves from this labyrinth. Hence, it comes, that the indiscriminate perusal of these works is so very dangerous, even for a great many physicians. Hence, it comes, that those physicians who respect the lives of their patients, and are not inclined to place an overweening confidence in their own judgment, find themselves obliged, sometimes, to recur to the original sources of information, and to try to discover, in the observers, the mystery of these apparent contradictions; and at other times, to repeat the experiments themselves, endeavouring to forget what they have met with in books, in order to learn it from nature. Hence, too, perhaps, that inveterate scepticism with which medicine inspires many enlightened minds.

The reader will have little difficulty in conceiving, that, when the circumstances are changed, the operation and effects of remedies upon the animal economy, can be no longer the same. Now, the circumstances, in which living bodies may exist, are as susceptible of variation, as the whole of the external or internal causes capable of acting upon them. In fact, they are synonymous with these causes; and as the delicate sensibility of the human frame renders it liable to be affected by a number of different agents, it is solely by the most diligent observation, that we can learn
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to apply the remedies precisely in the circumstances which indicate their employment, and that we become justly entitled to expect determinate effects from their exhibition.

SECTION V.

Of the Attempts that have been made to improve Medical Classifications.

THE abuse of system, as Aristotle had remarked even in his time, is not less injurious to the interests of science, than its total want. Of this we have just seen sufficient proofs, and the above-mentioned philosopher affords us more than one example in support of those we have already adduced. This tendency, indeed, appears to be one of the most deceitful and dangerous snares, if we may use the expression, to which the human mind is exposed.

In the course of daily practice, which obliges them continually to compare the methods of classification with nature, men of reflection very soon perceive the incorrectness of such arrangements. They see nature sporting, as it were, with that puerile pride, which fondly imagines it possible to
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compensate for inaccurate views by the pomp of system, and which appears desirous to dazzle itself by a sort of scientific splendour. They feel the necessity of recurring to the observation of facts, and of determining with greater precision the use of general terms. Hence the idea of definitions—the first step towards a reform of the methods of arrangement.

If our object were only to obtain purely rational views of science, and to examine the objects of research merely with reference to a few particular or very simple properties, definitions would certainly be sufficient for our purpose. They are easily understood, and enable us to reason correctly.

But the case is different when we attempt to apply our knowledge to practical purposes. Then, it is no longer question of abstract terms, which ought always to retain the meaning in which they were first employed. It is no longer the circle or the triangle of geometry; it is no longer the relations of fixed and invariable numbers. Nor is it that pleurisy defined by a phrase which calls to mind the cough, the pain of the side, the sanguinolent expectoration: but we have to consider various combinations of phenomena, always differing from one another, always particular and specific, that present themselves to view: and the more we are capable of just observation, the less we perceive of those supposed similarities of diseases,

eases, which have no existence but in the brains of unreflecting or inattentive observers. In short, we conclude by discovering nothing but individuals to exist in nature. Hence, Leibnitz was led to affirm, that there are not two leaves which resemble each other in every particular.

Thus, then, the inevitable errors, which the vague and undeterminate meaning of words introduces into our methods of arrangement, soon suggest the necessity of referring our general ideas to the elements of which they are composed, that is, to the objects, or to the particular facts from which they are deduced; the necessity of ascertaining, whether these ideas comprehend the latter exactly, and whether they may not presuppose others which have not been derived from observation; in fine, the necessity of accurately determining their mutual relations, and the precise meaning of the terms that are used to denote them. To attain this object, we, at first, have recourse to definitions; but we soon perceive, that their aid is very insufficient; that there are many serious inconveniences attendant upon classifications; and that a definition, in order to be exact, and to leave no vague impression upon the mind, must approach more and more to a circumstantial description, and can be perfected only by becoming an actual description of the object to which it refers.

SECTION VI.

Of other Difficulties which we have to encounter.

IN this way, inquirers find themselves brought back to the point from which they had set out, and surrounded by all the difficulties in which the multiplicity and variety of the objects of research had at first involved them. After having remarked the abuse of systematic arrangement, they feel more strongly than ever the state of absolute incapacity, in which the privation of this artificial instrument leaves the mind; and find, that they must either overcome these difficulties, or submit to waver perpetually between ignorance and error.

These obstacles that oppose an improved arrangement of the particulars of our knowledge, and these inconveniences, which manifest themselves, especially when we endeavour to apply our acquirements to practical purposes, are not the only ones we have to surmount. The study of different subjects presents different degrees of difficulty: the objects of research, for instance, may not be all equally easy to observe and investigate properly: the advantages we may derive from their use (the only relation in which it is of importance

portance to us to become acquainted with them) may be more or less extensive, more or less direct, and more or less obvious. The subjects which it would be most useful for us to study, are very far from being always the most easy to learn. To take an example connected with our subject: how much experience in observation, how much sagacity is required for distinguishing, in a disease, the primary and essential phenomena that characterize it,—the phenomena to which all the others are merely accessory or consequent! How great skill and discernment are necessary for appreciating the influence which the latter have on the original disorder, and for ascertaining the modifications they produce in it, even while they remain entirely subordinate! How much presence of mind and attention are requisite for following all the variations of symptoms; in order not to be deceived by the different appearances which the disease may assume, in its different stages, or by the changes, which its natural character, or new and unusual combinations of symptoms, or the influence of external circumstances may cause it to experience! Add to this the embarrassment, which the investigation of the remote or proximate causes cannot fail to occasion to an accurate observer.—Upon this point, however, I must beg leave to revert to opinions which I have elsewhere delivered, but which it is absolutely necessary to
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keep constantly in view, if we are desirous to become acquainted with the method of reasoning upon a series of observations.

The term *cause* should not lead us to regard the phenomena of nature as involved in one another, or as engendered and generative by turns: for our knowledge is entirely confined to facts—and all that systematic observation can effect, is to establish their analogies or differences, their mutual independence, or their subordination and connection. Two facts may either resemble, or differ from each other: they may appear always together, or may happen sometimes separately. If we observe one event constantly succeed another, we call the first the *cause*, and the latter we style the *effect*. But these terms impart no new qualities to the objects they denote; but merely express the order of their succession. However, it is of great importance for us to ascertain this order; since the presence of the former event announces with certainty the appearance of the latter. Without this sort of knowledge, all history would form but a vain series of recitals, wholly devoid of connection. Without this knowledge, the histories of different diseases, imperfect and ridiculous as descriptions, would become useless, and even dangerous, as standards of comparison for practice.

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But if it be difficult to ascertain the order of events, which the spontaneous operations of nature, or the ordinary course of things present to view; it is doubtless far more difficult to recognise and determine, with precision, the succession of the phenomena which may be called *artificial*, since art produces them by the systematic employment of various unusual agents.

A man, for example, experiences pain, after a variety of circumstances, which may be all equally capable of occasioning it. If this pain ceases of its own accord, amidst a number of other circumstances, which are complicated and connected together, nothing but ignorance and want of reflection could lead us to regard the real cause of the disease and of the cure as easy of discovery. If the favourable change takes place after the use of certain remedies, which, from analogy, were presumed to be beneficial, the conjecture, that they have really been so, becomes more uncertain in proportion as the instances of a similar success, in similar cases, are less numerous: and it is only in the course of time, and by repeated observations in different circumstances, that it comes to attain a very high degree of probability.

I have deemed it advisable to place in the strongest light these first obstacles that render the progress of the mind, in the study of medicine, and, above all, in the application of its general

views or principles to practice, so difficult and uncertain; thinking, that it could not but prove useful, to ascertain the different sources of our errors; sources which, unfortunately, are too prolific, and which are inherent in the very nature of the objects of research, or in that of the instruments we employ for investigating them and applying the knowledge we acquire to the common purposes of life.

SECTION VII.

We always necessarily revert to System, which, in itself, can never prove prejudicial. How, then, ought it to be applied to Medicine?

WE may observe, on the one hand, that the want of system can never be dangerous for any length of time; as nature too powerfully impels us to have recourse to its aid: and, on the other hand, we may remark, that the abuse of system always proceeds, not from itself, but from the imperfect manner in which its rules have been traced. We do not err, because we have too much method; but because that which we employ is not good. In proportion as it improves,

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we invariably perceive, that all the faults and inconveniencies, which we deemed inseparable from it, gradually vanish. The too general rules, drawn from the resemblances of objects, are corrected by other rules, deduced from their differences. We recur to particular facts: the distinctions and exceptions themselves are arranged, and formed into other more partial systems; and from all these successive operations, the effects of which serve mutually to correct or balance each other, are deduced results which become every day more accurate and perfect.

In the application, in fine, of our theoretical knowledge to the purposes of life, and to the alleviation of our daily wants; in those operations of the mind, in which the slightest errors of reasoning may be productive of the most fatal consequences; there is still an experimental and practical method, the offspring of the constant observation of facts, and of the uninterrupted employment of the instruments of study. A happy instinct, rather than science, points out the first principles of this method, and follows them as a sure guide, long before its proper rules can have been determined. But in a short time, science illustrates and extends them:—philosophical genius connects and arranges them, and, above all, improves their application. Enriched by the continual accession of new observations, di-

rected from day to day by views, at once more general and more sure, this practical method is, in time, enabled to rectify whatever is too absolute or rigorous in other systems too exclusively confined to theory: and when subjected itself to certain modifications, indicated or rendered necessary by particular circumstances, it becomes, in some measure, associated with the idea of talents, of which it is the offspring, but the place of which it never can supply.

In the study of the therapeutic branch of physic, or, in that branch which it is the aim of all the others to improve, the rules can be developed only at the bedside of the patient: and their application can be determined only by a long series of examples, which should, in a manner, exhaust all the possible combinations of symptoms, or, at least, repeatedly display the elements of these combinations; and which, in particular, should be firmly impressed on the memory, in order that we may be enabled to recognise, at first view, the distinguishing characters of each disease amidst all the complications which may disguise them and obscure them.

It is in this way, that skilful practitioners are formed, under the guidance of able teachers. Yet these teachers, it must be confessed, will often find, that it is impossible to communicate to their hearers certain delicate and fugitive perceptions; and

and that there are some sorts of reasoning, which cannot be expressed in precise terms, and certain operations of judgment, which are apt to be mistaken for direct sensations. The physician, in whose mind the motives of his decisions suggest themselves by a very rapid association, can impart them only to men equally well organized as himself. To acquire these perceptions, to form these judgments, reasonings, and decisions—is the exclusive attribute of genius.

SECTION VIII.

Of the great Influence which Language exerts upon the Sciences; and of its Reform.

AMONG the various causes capable of accelerating the progress of science, there is certainly none more powerful in its operation, than language:—a truth too generally admitted to require further proof and illustration in this place. Language, the first bond of social union, the offspring of the first fraternal ties, after having formed and ratified all the contracts of rising nations, has served to connect more closely the interests and exertions of individuals, to direct them

by an impulse that soon became independent of them; and, by associating itself with all the details of private and public life, has exerted the most powerful influence upon all the institutions, and upon all the customs of civil society. Wherever the language, and, in particular, the written language, was well formed, the progress of the social state has been rapid and sure. Wherever, on the contrary, circumstances, which it is almost impossible to determine with accuracy, had led to the adoption of a bad system of language, and of fixed signs, or of writing, the nations have remained in ignorance, or have groaned under the yoke of oppression.

But the advantages of language, when well formed, and its inconveniences, when vitious, have been chiefly felt in the sciences, and particularly in those sciences, of which the objects are very variable, and, consequently, often very imperfectly determined.

Words arrest, as it were, our sensations: they recall them and impress them; and by retracing them to the mind, they furnish us with the means of considering them in all their different lights, of comparing them with one another, and deriving from them our simple ideas, which form the immediate result of this comparison. These simple ideas, in their turn, perform, in some measure, the same part as our direct sensations. They be-
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come impressed on the memory, they are recalled, and compared, by the aid of words, and so forth. Whence we may perceive, that not only the more complicated and enlarged ideas are expressed, when formed; but are also formed and developed, by this artificial instrument of thought. It is, therefore, the accuracy and proper employment of words, or, more generally speaking, of signs, that we must regard as the criterion of truth: and it is to their vague character, and to the uncertain and confused manner in which they are used, that we must attribute the imperfect notions, the prejudices, the errors, and all the vicious habits, which the mind acquires.

In almost all the branches of medical research, the language employed is very ill formed. It has become gradually more and more vitiated, by the false application of words borrowed from the other sciences, and by a certain unmeaning and ridiculous jargon, which a culpable respect for prevailing prejudices has too often led practitioners to adopt.

It is from the Greeks and Arabians that we have derived our first notions of medicine; and, it is, in particular, from the works of Hippocrates and Galen, that the modern professors have borrowed the substance of their first doctrines. The diseases described by the ancients have retained the names which had been originally bestowed

upon them: the instruments, the remedies and preparations, which have been discovered or imagined by the Arabians, have been handed down to us, along with the terms by which they were designated by their inventors. When the use of written language began to be introduced into France, Latin was the language of the learned: our first medical works, accordingly, are composed in it. When French came to be used, medicine still retained its ancient terms, which suffered scarce any change but in their terminations. Besides, the barbarism of the schools was, at that time, at its height: and in them it was the fashion to speak in a manner both formal and burlesque, and to write in a style that was obscure and trivial, pompous and unpolished. In this state of things it was scarcely to be expected, that a medical language could be framed, which would be acknowledged by reason and by taste.

To take an example:—Anatomy, too often cultivated, as it has been, by mere dissectors, rather than by minds capable of considering it in its true light, is, perhaps, more than any other branch of medicine, embarrassed and obscured by this vice of words, which, in time, comes to disfigure the objects themselves. It is unnecessary to adduce the proofs of this assertion, which are really numberless; for the fact can be no longer

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a matter of doubt but to those who would be incapable of following its examination. Some insulated views on the necessity of reforming the language of anatomy may be found scattered in various works. Vicq-d'Azyr, who, in the Second year of the Republic, fell a victim to his ardour for science, and his zeal in assisting the poor with his knowledge, has prefixed, to his Anatomical Plates, a discourse on the spirit which should guide and direct this reform. Notwithstanding the respect I feel for the memory of a man who has done so much for science, I cannot help observing, that this part of his work is unworthy of the subject and the author. It happened to Vicq-d'Azyr, as it has done to some other men of letters, and philosophers, who imagine that they are following the *analytical method*, because they employ its signs and expressions. But, when we attempt to apply this method to new objects, we must adapt it to their peculiar nature and character; we must investigate and ascertain the rules which ought to guide its application; and we must, above all, avoid that confusion of terms, which it is its principal object to banish.

Two other celebrated anatomists and physiologists* have published plans of a new anatomical nomenclature. These plans discover the genius of their authors, and appear to have been dic-

* Dumas and Chauffier. T. 7. tated

tated by a true philosophical spirit. Nevertheless, I feel it incumbent upon me to make some general observations on the subject itself.

The design of language is to transmit and to recall to mind our ideas, or the conceptions of all the objects that present themselves to our senses. These ideas ought, in the first place, to be clear and precise. The *first* fault, then, of a language is, when the terms of it are confused, vague, and susceptible of several different meanings. Secondly, our ideas should be connected in a natural order, and classed in such a manner as to cause the relations that subsist between them to be clearly and distinctly perceived. The *second* fault, therefore, of a language will be, when its terms are not formed upon the plan of the actual generation of ideas; when they are transferred from one object to another; and when they are modified or combined without any determinate rule; when the application of rule does not remove every uncertainty with regard to the changes in their meaning, and indicate the relations and analogies of the objects themselves, in the grammatical relations and analogies of the words by which they are designated. The third property of ideas consists in their facility of recollection and communication. The *third* fault of a language, therefore, is, when it is difficult to be learned and retained. Lastly, this speaking picture, if we may
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to call it, of our sensations, or, rather, of the ideas which they generate, should be capable of displaying the different characters of these ideas, by the harmony, the elegance, the force, and the vivacity of its expression: it should follow all the movements of the mind, and trace all their shades of distinction; and should be able to address itself with the same success to the sensibility, the imagination, and the judgment. It is not merely the desire of pleasing, or the want of strong emotions, that imposes this last condition; but the clearness, the rapidity, the energy, and the permanence of the impressions require it; and it is by such means alone, that our interest and attention can be supported for any length of time. Those languages, which are at once exact and elegant, react, as it were, upon the mind, impart to it a new principle of activity, and, in this way, become the immediate source of a number of ideas, which never would have been produced without these additional impressions. Some persons may think, that the language of science should aim merely at accuracy, precision, and clearness; and, certainly, these qualities are of the most essential consequence: but the sciences have not only a peculiar kind of elegance and beauty; they have also their peculiar manner of moving the imagination; and, sometimes, without transgressing the bounds which a rigorous taste prescribes,

prescribes, they may address themselves even to the feelings of the reader.

It would be superfluous to explain, what is meant by a *precise term*. In order to be so, it is sufficient, if the word denote clearly a determinate object, and be in no way apt to recall the idea of any other.

The absolute necessity which there is for following, in the formation of language, the same path that nature pursues in the production of ideas, is now universally acknowledged by men of science; but I am of opinion, that they have committed some mistakes with regard to this point, the cause of which it may not be altogether useless to determine.

The human mind, in its inquiries, has but one mode of procedure, viz. from the *known* to the *unknown*. But, sometimes, from the nature of the objects of research, this method may appear to assume an inverse order. In the formation of a great number of our ideas, we proceed directly from the *simple* to the *complex*; while, in others, we begin with the complex in order to arrive at the simple. Thus, for instance, when our moral sentiments first begin to be developed, and when the mind first examines and endeavours to reduce them to system, we begin with the most simple data: afterwards, we combine these data, compound them and recompound them, as it were, to infinity,

infinity, without ever being able to reach the term of these combinations and compositions. In the study, on the contrary, of those substances, the analogies and relations of which we are desirous to discover from the characteristic properties of their elements; in chemistry, for example, the principal object of which is to separate the constituent parts of bodies,—the compound substances are the first which offer themselves to view; and the simple ones, or those which we regard as such from not being able to decompose them, are always, of course, the last known.

Thus, the first ideas in moral philosophy, and the first terms we employ in the science, involve, if we may say so, nothing more than themselves, and are scarcely susceptible of decomposition. In the first stages of civilization, for example, the term *virtue* implies merely the idea of *strength*; and the use of the word does not extend beyond its direct meaning. But, by degrees, the idea of *virtue* comes to comprehend that of several other qualities or dispositions, and the signification of the word is thus rendered every day more extensive and complicated.

In chemistry, on the other hand, the first objects of our researches are compound bodies. In proportion as we make new discoveries, analysis generally resolves these bodies into simple elementary principles; and the degree of this simplification

fication may be regarded as an accurate criterion of the progress of the science.

In both these examples, the mind proceeds from the *known* to the *unknown*, but not always from the *simple* to the *complex*.

This naturally leads me to offer some remarks upon the new nomenclature of chemistry. My high respect for its original authors, whose labours have imparted the most powerful impulse, and given the most useful direction to physical science;—my private esteem for those who are still living, must be sufficient to secure me from the suspicion of wishing, in any manner, to detract from the importance of the services they have rendered by the reform of a barbarous and absurd language. Besides, as the men of science, in all nations, have shewn their eagerness to adopt the new nomenclature, and as its employment affords, in reality, many important advantages, the propriety of it, in itself, can be no longer called in question. But, as it has been held forth, perhaps, in too unqualified a manner, as the model of other reforms of a similar description, which are required in various branches of science, some observations upon the principles that have guided its authors, will not, I think, appear altogether misplaced.

In chemistry the true radicals of the terms employed are not the simple substances; but, on the contrary,

contrary, the compound substances : These are the first known ; and they are the first that receive names. According to the sound principles of analysis, therefore, ought not the names of the former to be derived from the latter ? For the first term of a good chemical language should not be that which expresses the last result, and which, consequently, may be often the product of hypothetical opinions. In such a case, the erroneous meaning that may be attached to it will naturally vitiate the sense of all the other words with which it may be combined. To conclude ; by the adoption of such a mode of procedure, it will probably be found necessary to create a new language, whenever more extensive or more accurate experiments shall have overturned the hypothesis, or merely enlarged the boundaries of the science.

Suppose that Stahl, after having composed his Treatise on Sulphur, one of the works which most clearly evinces both his skill in performing experiments, and his rare sagacity in reasoning from facts ; suppose, I say, that Stahl had at that time undertaken to reform the barbarous language of chemistry, his confidence (just as it must be allowed to have been) in the exactness of his labours ; the admiration of the small number of competent judges of his merits, at that time in Europe ; the necessity which had become very urgent,—the necessity which he might have perceived

of transferring, to the signs employed to denote the objects of research, the same accuracy that was observed in experimental inquiry: all this would doubtless have justified such an enterprise on his part. Now, if in executing this reform he had not followed the order of the developement of our ideas; that is, if, in the formation of his terms, he had neglected to begin with those of compound bodies, such as they at first present themselves to view, in order gradually to deduce the names of the products of their decomposition, his new language would not have lasted much longer than his system, upon which, of course, it must have been founded. If, on the other hand, he had followed the true path of nature, he, perhaps, would have completely superseded the necessity of the reform which has been effected in our time. It would have been sufficient to have added the names of the newly discovered substances to those which were already known; to have derived these new terms from the old ones, at least, as often as this order of their formation was the same as that of the ideas they expressed; and to have combined them according to the most simple and natural relations. In this way, we may perceive, that the nomenclature would have had the same arrangement as the ideas themselves; and that the new terms, as well as the new ideas that were acquired, would have arranged themselves

selves spontaneously, in a system that was designed upon a uniform plan. For a skilful author, in the classification of the different sciences, ought always to leave room for future discoveries; and the same may be said of a language that is well formed: it should furnish the tests, if we may be allowed the expression, of the new terms which these discoveries may require.

With regard to the reforms which have been proposed in the language of anatomy, it may, perhaps, be doubted, whether the name of any particular part ought to comprehend the description or definition of the object it was meant to express. To me it does not appear that it ought. The simple words, of which the sense is direct, are unquestionably wholly arbitrary *. Provided that their general acceptation be determined with accuracy; that they do not sound harsh to the ear, or recall disagreeable ideas to the mind; it is of very little consequence that they have been formed according to such or such a system. It is only with regard to the more complex words which are derived from them, or with respect to those which assume a figurative meaning, that we must be careful to follow the natural analogies, and to reproduce, if possible, the sensations by which we

* In this circumstance, indeed, it must be confessed, one of the greatest advantages of language, and, in general, of all artificial signs, consists.

become acquainted with external objects. A *leg* or an *arm* might be equally well designated by two other words, provided that the acceptance of these arbitrary terms were perfectly agreed upon, and that they never could be understood in a different sense. The language might be more or less harmonious, more or less elegant: but it would be always exact and perspicuous. *Bitter* and *sweet*, which are simple qualities of objects, at least with reference to the impressions which they make upon our organs of sense, might be expressed indifferently by any other description of terms. By such a change we should lose nothing, either with regard to the precision of the meaning, or to the facility of the conception, or recollection of these ideas by the operations of memory. When we utter the words, *leg*, *arm*, we neither describe nor give to understand, by these terms, the properties of the objects they recall to mind: when we say *bitter*, *sweet*, we do not give the history of bitter and sweet substances, nor even of the sensations they produce. But if we alter the meaning of these words, by applying them to other objects, if we endeavour to combine them with other words, in order to express complex ideas; it is then no longer possible to adopt and to follow an arbitrary method. If, for instance, we apply the word *arm* to certain parts of a tongs or chair, and the word *leg* to other parts of a table or stand;

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in order to be clear, and, indeed, to avoid becoming completely ridiculous, we are obliged to follow certain determinate rules of analogy. If we compose a word to express a complex sensation; if, for example, we say *bitter-sweet*, we shall still be obliged to follow some other rules, which must be determined by the character and design of the combination of ideas and composition of words.

Having once ascertained these principles, it will be no difficult task to appreciate the merits of some nomenclators who have endeavoured always to include the properties of an object in the word which denotes it. These properties differing very much according to the point of view in which they are considered, it is easy to perceive, that their names may be equally various: and in this way, we have again recourse to another arbitrary mode of proceeding, but which wants the advantages of brevity, simplicity, and unity; for the same object will then require as many different words to denote it, as there are different points of view in which it may be regarded.

To recur to examples. One of the most defective parts of anatomical nomenclature is certainly that of myology, or the description of the muscles: and it is also by its improvement, that the reform of anatomical language has, in general, been attempted to be commenced. But the chief fault with

which it can be reproached is not, that it is overburthened with words of which the origin is unknown to the generality of students; or that it is incapable of rousing their attention, or aiding their memory by the relation of the compound terms with the primitive or radical words; and of the terms of which the sense is complicated or figurative with those of which the meaning is simple and direct: but it has chiefly erred in the attempt to represent the properties of objects, or of the circumstances that characterize them, in the original formation or composition of the terms it employs.

Nothing, besides, is more variable, than the plan and proceedings of ancient nomenclators in this respect. Sometimes, they confined their views to the figure of the muscle, as is seen with regard to the *trapezius*, the *splenius*, the *complexus*, the *fascia lata*, the *deltoid*, &c.: At other times they distinguished it by its real or supposed functions, as that of *obturator*, *flexor*, *levator*, *sphincter*, &c. Sometimes, again, they designated it by the place which it occupies, as, for instance, the *palmar*, *psoas*, *spinal* and *temporal* muscles, &c.: At other times, the word which denotes it relates to the structure of its fleshy part, as is exemplified in the *digastric* muscle: lastly, the situation, number, or direction of their insertions, have furnished the names of several. In framing this language of myology,

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pedantry seems to have united all its efforts, and certainly not without some success.

In justice, however, to the authors of the new nomenclature, we must acknowledge, that all these inconsistencies have disappeared from their system. Their denominations are formed upon a uniform plan. The name of each muscle indicates its insertions: and to this sole characteristic they have confined themselves; which, indeed, has given the appearance of greater uniformity to their language. But it is possible, and even expedient to consider the muscles in many other points of view, in order to acquire a proper knowledge of their structure: and, besides, as their insertions are often very numerous and complicated, one of two things must happen; either, that the name will express them but imperfectly, or that it will be composed of several words joined together. Now, in the latter case, it frequently assumes a pedantic, and, sometimes, a ridiculous form, and generally becomes very difficult to retain in the memory, and very inconvenient in use.

A word, I repeat, is not a description: it ought not even to be a definition: but it is sufficient if it designate, in a clear and unequivocal manner, the object which it represents. To describe this object, to recount its properties or its functions, is not to name it, but to relate its history. We might as well enumerate the elements of which it

is composed, retrace its analysis, and display the results.

The importance of the subject will, I trust, be a sufficient apology for these details into which I have judged it expedient to enter. It is evident, that, in this place, it would not have been allowable to pursue the inquiry so far as it deserves; but the above observations may serve to convey a pretty distinct idea of what I mean by *a well-formed language*, and *the analytical reform of language*. This is the sole object I have at present in view.

SECTION IX.

Of the false Application of other Sciences to Medicine, and of the Doctrines of the Mechanical and Ancient Chemical Sects.

IN this place, I cannot help reverting to the consideration of another cause (already often particularized) of the systematic errors of medicine;—errors, that introducing themselves, as they have generally done, into practice, which they had the appearance of simplifying, have so frequently rendered the science of physic more hurtful than beneficial to the unfortunate patients. I allude
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to the improper application which physicians have often made, to their art, of the general theories or particular views belonging to the other sciences. Bacon remarked this abuse, even in his time, and foresaw all its fatal consequences. He regarded it, with too much reason, as the cause of all those deviations from the true path of inquiry, which the vogue of each new system has led the science of medicine to commit. It is to it that he particularly ascribes the uncertainty which this science has almost always evinced in its progress, and the little advantage which it has hitherto derived from the most splendid discoveries in the other arts and sciences with which it is properly connected. We ought, therefore, to begin by separating medicine from the sciences that do not relate to it: and its principles should be deduced solely from such facts as really belong to it, that is, from observations and experiments upon the living body, in its healthy and diseased states. If, in the course of time, we can connect these facts with the principles appertaining to the other sciences, it should only be after having verified both separately. Such was the opinion of Bacon.

A physician of very great talents, whom I have already quoted with respect, but not with enthusiasm, Baglivi adopted this idea in his lectures and writings. To it, indeed, he certainly was indebted for a great portion of his success; and he appears to

to have erred at times, only from not always adhering strictly to it. Latterly, Barthez has extended it, and supported it by all the proofs of which it is susceptible, in a work that is conspicuous not only for enlarged views of medical science, but also for philosophy and erudition.

At the time of Hippocrates, the science of medicine, as we have seen in the former part of this work, had been already corrupted by its conjunction with the prevailing systems of philosophy and cosmogony. Hippocrates perceived, with great acuteness, the inconveniences that resulted from this alliance. This assiduous observer saw clearly, that nature generally pays no regard to the theories by which we pretend to explain her operations, and that animated nature, in particular, has its peculiar processes, which we must study in the facts themselves, and not attempt to divine by vain conjectures, or more vain calculations. He, accordingly, attacked this abuse very forcibly. Yet, a respect for truth, which ought always to take precedence of a respect for persons, however great their genius and their services may have been,—a respect for truth obliges us to acknowledge, that, oftener than once, he himself yielded to this propensity, perhaps the most predominant in the human mind. In the place of certain doctrines which had become antiquated, or had been refuted by his own observations, he substituted others,

others, that, no doubt, approached nearer to the truth, but which, nevertheless, were nothing more than conjectures. It is to him we owe that system of the *Elements*, which holds so conspicuous a place in the writings of the ancients, and in those of their modern abridgers or compilers;—a system which soon gave birth to that of the *Temperaments*, as they were at first classed. Hippocrates went still further: he pointed out the more methodic application which was made of this system, after his time, to the qualities of the principal fluids of the body, and even to the character of the different seasons, each of which had that of one of the elements assigned to it, and was supposed to preside over one of the humours.

In fact, although the system of Galen tended, perhaps, rather to overturn the opinions that had prevailed before him, than to revive the true Hippocratic theory of physic, yet its author has done little more than develope, in a classical style, the different views that are found diffused through the works of the Physician of Cos, or in the writings which his disciples have ascribed to him.

The reader is already apprized, that this system reigned in the schools, with despotic sway, during several ages. Assailed, at the same time, by the admirers of Hippocrates, by the chemists, and by the empirical observers, it long bade defiance to all their redoubled attacks; and the
practice

practice of the art still feels the effects of its long tyranny, even at this day, when no truly enlightened man would venture to declare himself an adherent of Galen.

We have seen above, that Asclepiades founded his system of physic upon the corpuscular philosophy. The strong constitution of the Romans, however, seems, in some measure, to have braved the erroneous practice of their physicians, and to have withstood the prescriptions of Asclepiades, as it had formerly done those of Cato the Censor.

The Methodic sect succeeded Asclepiades, and introduced a new theory and new plans of treatment.

The first Chemists had attained a just superiority over the schools. They had overthrown the Galenian system, by reasoning and by facts: they had discovered many powerful remedies, by the aid of which they were enabled to produce many new and surprising effects, and to accomplish many imposing cures. By these same medicines some quacks still contrive to make their fortune, who employ them with more boldness, than men of true science venture to do, and in whose hands they, no doubt, often prove fatal, but sometimes effect a cure;—which is sufficient for their purpose. Thus, Paracelsus, by the employment of opium and different mercurial preparations, often assumed the appearance of a sovereign deity whose mandates nature obeys.

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In a short time, however, the operations that took place in the matrafs and alembic, became, in the eyes of these daring experimenters, a faithful image of the operations of the living system. The vital functions, and the organic movements of every description were believed to be nothing more than certain *fermentations*, *ebullitions*, and *sublimations*. Thus, the faculty of contraction peculiar to the heart and arteries, the power of moving the limbs peculiar to the muscles, and all the effects resulting from these general properties, were supposed to originate in particular *effervescences* and *explosions*. The production of animal spirits was imagined to be performed by a real *sublimation*, in which the brain performed the office of the capital of the alembic. The *acids* and *alkalies*, sometimes, opposing each other with violence, at other times, uniting quietly, were supposed to influence or modify almost all the organic functions. The acid juice of the pancreas combined with the alkali of the bile, in order to complete the grand digestive *fermentation*: and the mixture of the acid of the chyle with the saline or sulphurous principles of the blood served to produce the animal heat, &c. &c.

Led involuntarily into these repetitions, I, at least, should avoid their unnecessary multiplication. I shall therefore conclude by mentioning, that one of these chemists, Tachenius, carried this

this mania so far as to ascribe to the acids diffused through the body, which he regarded as the causes of all its disorders, a sort of prudence and discernment, that enabled them to select from among the alkalis of the aliments or medicines, such as were most proper for their neutralization.

Before the light of rational experience was able to dissipate this mass of absurd chimeras, their systematic application to the treatment of diseases had been attended with very fatal consequences. The true spirit of philosophy is diffident, and advances slowly: but the spirit of conviction and confidence, peculiar to enthusiasts, is as quick as it is presumptuous. Disorders and misfortunes were daily increasing, and public opinion seemed to be deviating every day still farther and farther from the truth. However, a certain boldness in rejecting the yoke of sanctioned opinions; a certain restlessness, which, if it do not directly lead to truth, must, at least, prevent the mind from long pursuing the path of error, were still able, amid so many gloomy objects of contemplation to the philosopher and true medical observer, to inspire them with just hopes of the future advances of science. Indeed, it seems to be the peculiar characteristic of the chemical errors introduced at different periods into medicine, that they have, in general, no doubt, misled

led inquirers from the right path of research; but have never, perhaps, really retarded the progress of the science: and the practice of the art owes the knowledge of many powerful remedies to their most dangerous experiments.

During the seventeenth century, geometry and algebra were cultivated with much ardour and success. It may even be said, that they became a sort of fashion. About the middle of the eighteenth century, the enthusiasm appeared to revive. Fontenelle and Maupertuis, who were men of the world, contributed to diffuse a taste for these studies, more, perhaps, by their conversation, than by their writings. Maupertuis, with his ardent imagination, and his bold and comprehensive views, carried along the indolent minds, who are always desirous of novelty. Fontenelle, by the refinement of his ideas, by his peculiar manner of simplifying the most complicated subjects, and of connecting the most distant, and by his talent for translating into common language the truths that are farthest removed from received opinions, succeeded in making his hearers as well as readers believe, that they comprehended perfectly all that he described to them in a rapid but perspicuous manner.

About this time, as we have already seen, the philosophy of Descartes, had become very generally prevalent. By the application of a new instrument of research

research to the most difficult and important parts of the Science of Extension, Descartes had, in some measure, made a new science of it. A novel species of calculation, that was bolder in its views, and more powerful in its operation, seemed still more effectually to place geometry at the head of the sciences:—and in its rigorous forms they imagined, that they had found the proper test of truth.

It was not to be expected, that physicians could have remained quiet spectators of this general enthusiasm. They saw many of the most remarkable phenomena of nature subjected to calculation. To become susceptible of this species of proof it is sufficient, that the phenomena observe a regular order in their succession; that their appearances, revolutions, and changes, afford certain fixed points of view, in which they may be leisurely considered. The functions of the animal economy appeared to offer these characters*. Geometry and algebra, accordingly, were applied to them with confidence; and physicians imagined, that the certainty of the instrument would be transferred to the results. All the learned in

* The phenomena of life, may, no doubt, in some points of view, be subjected to calculation: but these points of view are, in general, of little importance, and the most accurate investigation of them throws scarcely any light upon the most interesting problems of physiology and medicine.

them in this belief; and these results published, as they were, in a dogmatic manner, were long regarded as oracular.

Thus, Borelli, who may be called the classical geometer of medicine, proceeding upon the supposition that the food, subjected to pressure from the action of the abdominal muscles, diaphragm, and coats of the stomach, was triturated during digestion, estimates the force of the muscles employed for this purpose to be equal to a weight of 261,186 pounds. Wainwright computed it at 260,000; Fracassini at 117,088; and Pitcairn at 12,900 pounds. It is now, however, proved, that digestion is performed by other means; that no trituration takes place in the stomach; and that the motion of that organ, as well as of the intestinal canal, is almost imperceptible in the healthy state, even after the most copious meal.

According to Borelli, the combined force of the two ventricles and auricles of the heart is equal to 180,000 pounds. Hales calculates it only at 51 pounds, and Keil reduces it to 1 pound. This enormous difference in the results of the calculations, which ought, of course, to be always similar, if the data were in the least accurate, clearly shews the falsehood of them all.

Before the injections of Schwammerdam and Ruysch had proved, by ocular demonstration, the gradually decreasing series of the vessels that convey

vey the different animal fluids, the science of hydraulics, which was then in a very low state itself, acted but a subordinate part in medicine. But since that time, so remarkable, in other respects, for brilliant discoveries, the *tubes*, the *valves*, and the *pistons*, have infested the nomenclature of medicine. The laws of equilibrium, of friction, and resistance, the alterations in the force of the impelling powers, from the number, diameter, or direction of the tubes, have been introduced, as necessary data, into the explanation of the phenomena of the living system. Almost all the sects of physicians adopted, at least in some respects, many of these illustrations; and, in practice even, it became customary to consider the human body, merely as a systematic combination of ducts, communicating with each other, and in which nothing more was necessary, than to promote the free and easy circulation of the fluids.

But, in reviewing this period, I find myself obliged to recur to subjects that I have already discussed, and feel again the necessity of curtailing these repetitions. Indeed, it is, in a great measure, superfluous to expose all the absurd and ridiculous consequences, which the different sects of modern Solidists, have deduced from a small number of observations, that in themselves were sufficiently just. And it is hardly necessary to
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remark, that general and very important offices have been ascribed to organs possessing only very secondary or very limited powers; and that imaginary relations have been established between organs or phenomena, which have no connection whatever.

This mass of incoherent opinions, which mutually subverted each other, forms almost the only fruit of the premature alliance, which the pride of science was desirous to establish between physic and the other branches of knowledge. The examination of all the other hypothetical systems that have been framed in a similar spirit presents the same view of the subject.

How much reason have we to deplore the errors, to which practitioners open their eyes, for the most part, only after they have proved fatal to a number of unfortunate victims! In those sciences, of which the practical application does not directly relate to our most urgent wants, or in which the mistakes committed may be easily rectified, errors in theory shock, no doubt, enlightened minds; for, in a single instance of erroneous reasoning, they are able to perceive the source of many false and dangerous consequences, which may issue from it, as from a poisoned spring: but, in general, such errors are not of serious and direct importance. The Ptolomean system of the world evinced, and probably prolonged the infancy of astronomy: but in practice

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tice it was productive of no pernicious effects; it was even sufficient for the common operations of the science. The Phlogistic theory of Stahl has not, as far as I know, proved fatal to any one; and even the progress of chemistry does not appear to have been much retarded by it.

In medicine the case is very different. The application of the rules which the practitioner lays down to himself is direct; and in their choice, no one can err with impunity. The least erroneous view leads to some consequence: we must remember that the lives of our fellow creatures are at stake. For how many cruel and premature deaths, how many impaired and debilitated constitutions have paid for the follies of theorists!—follies which have proved almost always fascinating. The study of a system is more easy than the investigation of nature; and in practice it seems to smooth every difficulty. The mind loves to repose upon principles, which it believes itself entitled to substitute in the place of observation; and when these have been diffused to a certain extent, and have become a sort of creed for weak and servile understandings, if misfortunes accumulate, and victims fall a sacrifice, under this new scourge of humanity, they generally look for the cause of these evils in frivolous circumstances, and are almost tempted to censure the eternal laws, without reflecting that these must always tend to our good.

SECTION X.

The Science of Medicine tends naturally to Hypothesis, from the Nature of the Subject to which it is applied.

IN this stage of our inquiry two questions naturally present themselves to the mind: In the first place, how comes it, that so many men of information and talent, who have had daily opportunities of observing diseases and their cure, should have allowed themselves to be misled by ideas, which their constant experience served to confute? Secondly, how happens it, that the authors of the most wretched theories have sometimes proved very skilful practitioners?

To the former of these questions the answer is sufficiently easy. Nature seems to have stamped her works with false features of resemblance; or, to speak more correctly, we often discover imaginary relations between them. Frequently, too, we may perceive relations that actually exist, but which are foreign to the immediate objects of our researches: and the more important the objects are to which they refer, the further they are removed from our original conceptions, the

more do they become disfigured by these incorrect relations that we have traced between them.

In fact, amid the vast variety of productions and phenomena with which the universe abounds, the human mind is eager to class them, or to discover analogies by which they may be connected. Now, it is, in a manner, impossible not to find some common characteristic marks, even among objects that differ most essentially from each other: of course, we cannot fail to recognise them among objects that exhibit some features of true similitude, but which resemble each other only in certain points, either of little importance, or altogether foreign to the end that we propose to ourselves from their connection.

The different bodies that present themselves to view are governed by peculiar laws, which enable us to distinguish and arrange them.—Some among them which discover no traces of organization, no sign of automatical movement resulting from their peculiar conformation, follow the general motion of the universe, and are subjected to the common law of attraction, which we regard in this case as alone acting upon them.

Other bodies equally inert in appearance are found, however, combined in a regular order which we observe with astonishment; but which science has found means to subject to calculation, and which art can imitate and reproduce. Of this description

scription are salts and crystals, and various mineral substances, not comprehended under either of these heads. Bodies, in this state, which we may regard as a *second* gradation of existence, are impressed by the peculiar laws that govern them, with certain uniform characteristics by which they may be distinguished.

On the surface of the earth that we inhabit, and around us, as if to anticipate our wants, grow those innumerable families of plants, the aspect of which serves to charm the eye, while their various products supply us with food, clothing, lodging, and the means of employing fire for the common purposes of life; and of thus procuring a variety of additional enjoyments. When we examine them attentively, their forms and qualities appear, no doubt, to be widely different: yet certain common properties and general modes of existence connect them; and the abridged descriptions that express these properties and modes of existence, give the distinguishing character of what we term the *Vegetable Kingdom*; which forms the *third* gradation of existence.

An organization more or less perfect, a sensibility more or less exquisite, serve to distinguish animals from each other : but all of them feel, and all are organized so as to receive those sensations which are suitable to their destination. Some remain stationary in the place which chance assigns them.

them, and form only a sort of living plants. Others are endowed with locomotive power, and may display their activity and satisfy their wants in different parts of the earth or ocean. These latter possess, in some measure, a higher degree of animal life; for this single circumstance multiplies both their desires and the means of gratifying them. All these beings, so different from each other, are found to possess a common faculty, capable of refinement, in proportion to the greater or less delicacy of the organs by which it is exercised, and of enlargement, in proportion to the greater or less number of the objects to which the appetites of the individual or species are directed; but which, however, establishes a general connection between all sensitive beings, and at the same time, separates them by a distinct line of demarcation from all those not endowed with feeling.

This constitutes the *fourth* and last gradation of existence, at least with respect to us, who do not behold, and who consequently cannot figure to ourselves, any system of more complicated organization from which new properties might result. Accordingly, we are reduced to the necessity of attributing the qualities of the beings known to us from observation, to those which our imagination pictures to itself, as placed in other worlds resembling our own, or diffused, like a vivifying power, through all the infinity of space.

To these different laws, which govern all the beings with which man is acquainted, we must add those of the decomposition of bodies, either as produced by nature, or imitated by art, or of which invention supplies the means;—laws, which, no doubt, comprehend all those relating to the results, or to the new substances obtained by this decomposition.

It is far from improbable, that the new bodies and properties produced in these last-mentioned instances, might, according to the invariable laws of matter, be referred to some one or other of the four preceding gradations of existence; and we may hope to be able one day to assign them their proper place. But several important questions must be first resolved, and, perhaps, some great discovery must have furnished us with new instruments of chemical research, before we shall be able to refer the phenomena of the composition and decomposition of bodies to the general laws of physics.

Thus, from inanimate to animated matter, from the inert clod in the bowels of the earth, to the being who feels, and who becomes susceptible of moral affections and of thought, every thing is linked and connected together: but the lines of separation seem to be traced by Nature herself; and systematical arrangement, while it determines them, only confirms the real distinctions, that may
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be observed to subsist between the majority of the objects which they separate.

We must, however, remark, that the distinctive characters of each class are found to apply, in some respects, to the class that immediately precedes or follows it. Thus, crystallizable bodies exhibit phenomena peculiar to themselves, and which are perfectly distinct from those of irregular masses of matter; but at the same time, they are subjected to the general laws of physics by their properties of extension, gravity, &c. Vegetables, on the other hand, seem to resemble the class of crystallizable bodies, in several particulars, while, in others, they approach to the nature of living and sensitive beings; and the latter, while they rise by degrees to the utmost perfection of their class, can scarcely be distinguished, in their inferior species, from some of the vegetable tribe.

In the class of animals, and, particularly, in the human species which is placed at their head, we observe a series of phenomena common to all the other classes.

Some operations of the animal economy are to be referred, at least, in certain points of view, to the laws of simple mechanics; while others are the necessary consequence of the particular structure and mutual relations of the organs: there are some, too, that result from the laws to which fluids are subjected in a given apparatus of tubes; others

others that are purely chemical; and others, in fine, that are to be exclusively referred to the sensibility of the system.

In locomotion, and in all the actions that concur to produce it, the power of the muscles is exerted in the same manner, and according to the same laws, as that of different sorts of levers, which they resemble in several particulars; and its operation is estimated in the same way as that of any other moving power, provided the circumstances of this operation, the nature of the resistance, and the weight to be raised, be well known. The formation of the bones, and of some morbid concretions, seems to be referable to the process of crystallization, if we take this word in its most general and extensive meaning.

It is not without some appearance of reason, that the most attentive observers have applied the term *fungus* (*végétation charnue*) to certain animal excrescences, devoid of sensibility, which seem to be engendered and nourished in living bodies after the manner of parasitical plants. Some, even, have regarded the formation and maintenance of the fetus *in utero*, as a sort of vegetation, it being supported by the juices which it imbibes by its *roots*, or the veins of the placenta, till more enlarged and varied wants have developed its appetites, its tastes, and its passions. It only becomes, they affirm, a real animal, when it experiences

riences distinct desires; when it is capable of combining the sensations that depend upon these desires themselves, or upon the means of satisfying them; when it thinks, judges, wills: till this takes place, its whole existence is limited to the instinct that renders the application of the nutritive juices necessary. Although in this instance, the analogy is, no doubt, too far strained, yet it is not altogether unreasonable to suppose, that this first stage of animal life resembles, in many respects, the permanent state of vegetable existence.

To conclude: certain decompositions that are constantly taking place in the animal economy; the disengagement or formation of certain aëriform fluids; the neutralization of certain substances and the effervescences that accompany it; the mode in which the food and different combinations of medicines operate; all these phenomena, I repeat, really belong to chemistry; and although, in general, they seldom take place but in the stomach and intestinal canal, or in certain parts which receive, either from nature or accident, only a small degree of vital energy, yet they have served to suggest several useful views to practitioners, but not (hitherto at least) to furnish a solid basis for the principles of a chemical system of medicine.

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These observations serve for answer to the first question which we have suggested. The different characters that are blended in the greater part of the phenomena of the animal economy are sufficient to explain, and even, perhaps, in some measure to apologize for the prevalence of so many hypothetical opinions which might all claim the testimony of some facts in their favour*. For mankind have not erred so frequently, and in so fatal a manner, without being able to colour their errors with some plausible pretexts. The most absurd opinions commonly spring from the abuse of a few incontrovertible facts; and the grossest errors frequently depend upon certain acknowledged truths, to which a strained meaning has been given, and of which an improper application has been made.

With respect to the latter question, or the inquiry, how it happens, that very erroneous theorists have frequently proved very skilful practitioners, the answer is also to be deduced from the nature of the subjects which the science of medicine embraces, and from the method of procedure which is most familiar to our mind. Perhaps, too, this remarkable phenomenon may be referred to certain habits of philosophical reasoning, which

* Hence the observation of the ancients, that the human body is, as it were, a world in miniature, which affords specimens or models of all that passes in the great world.

those physicians, who are endowed with any portion of good sense, are, if we may use the expression, compelled to contract in the practice of their art:—habits which may be observed in men of very inferior talents in other respects, and which are felt to be useful even by those whose imagination has been most egregiously deluded. In fact, it seems scarcely possible to be constantly engaged in the contemplation of animated nature in all its different points of view; to behold the production of so many phenomena; to investigate the nature of the physical and moral constitution, in its transitions from health to disease, from life to death, without acquiring more just ideas of the nature of man, of his faculties, of their employment, and of the true end of his existence. In studying with attention all the characteristic features that distinguish his different conditions; how many observations occur, which afterwards oppose an insurmountable barrier to the inroads of prejudice! How many interesting objects present themselves for the gratification of our curiosity, which is both quickened and regulated by their contemplation! How many views unfold themselves, that show men and things as they are, to the least penetrating observer!

In the first place, every disease, when reduced to the form of a problem that we endeavour to solve, or of an enigma that we attempt to explain,

plain, contains, no doubt, within itself, the data of its method of cure. These data consist in the character, number, and reciprocal influence of its symptoms. In order, therefore, to attain the greatest degree of certainty, facility, and readiness, this method should bear a strict reference to them. We must not, however, imagine, as I have elsewhere observed*, that we can effect a cure only by a single plan of treatment. In all probability, there is one for each particular case, which is preferable to all others; and the skill of the true physician is shewn by approaching as near to it as the nature of things and the imperfections of our intellectual powers will permit: but different, or even contrary, methods, at least according to common opinion, may conduct us to the same end, that is, to the cure: and, as it is almost always impossible to estimate the dangers of the plan which has been pursued with success, the physician and the patient remain in general convinced, that it is the most perfect one. I have also shewn, that there are not so many inconveniences attending this mode of thinking and judging, as one, at first sight, might be led to suppose.

Secondly, several able practitioners, such as Sydenham, although under the influence of erro-

* See the work, entitled, "On the degree of certainty to be ascribed to Medicine."

neous theories, had yet the prudence to make no dangerous application of them. At the same time that they confided in their justness, they did not go beyond the facts which had suggested them; and in their treatment of diseases they never regarded them as certain rules for procedure in new and unprecedented cases. Hence, their systematic errors were attended with scarcely any bad practical consequences. They conducted themselves nearly in the same way as they would have done, if they had adopted no hypothesis whatever respecting the principles of their art.

In fact, between the rational empiric who does not go beyond the reasonings directly deducible from observation, and the theorist who applies his speculations only to phenomena similar in every respect to those upon the accurate analysis of which he has founded it, there is really no difference. Both placed in similar circumstances would follow precisely the same plan; that is, the plan which experience had shewn them to be useful: and if, after all, their practice should differ, this would not happen, on account of theory being adopted by the one physician, and rejected by the other; but solely in consequence of the diversity of the curative methods which had guided their experiments. Thus, the errors of the theorist, who would cautiously confine himself within these limits, would be errors only
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for the persons who might think proper to adopt them after him; and who, not being actuated by the same views, could scarcely be expected to restrict, in a proper manner, the practical application of his principles. For the followers of a sect are always much more inclined than the inventors themselves to push their systematic opinions to the most absurd extreme. Leibnitz, in the society of his intimate friends, used sometimes to laugh at his *monads* and *pre-established harmony*. Wolff, on the contrary, was very far from laughing at them. Stahl ridiculed pretty freely the ill-judged applications, that several of disciples had made of his system; and admired them for being more complete Stahlians than himself. To them, however, nothing was more galling than the jests of their master, which hurt their feelings, but did not abate their faith: and they piously endeavoured to conceal them, as the children of Noah went backward to cover the nakedness of their father.

SECTION XI.

Has the Application of a more rigorous Philosophical Method to Medicine tended to deprive the Science of any real Advantages?

SUCH is the progress which the philosophy of medicine has made. It has overthrown the greater part of the theories that prevailed, and cast a degree of ridicule upon the rest; and the observations, or facts relating to each branch of the art, are, in a manner, all that has survived this general convulsion.

But, by defining the province of medicine, and reducing it apparently within very narrow limits, it may, perhaps, be questioned, whether the employment of philosophical methods have not injured the interests of the science itself: whether past opinions have not been censured from pride, rejected from vanity, or suppressed from disgust: and whether this great revolution, like the majority of those which have preceded it, may not proceed entirely from the restless love of novelty, the ignoble desire of annihilating the labours of our predecessors, and that turbulent spirit of activity which is incessantly leading men to innovations in the general conduct of affairs.

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But it is surely very absurd, to regard the reform of science as an injury done to science itself, and the rejection of hypothesis, as a subversion of principle. General views should be deduced from facts. If they flow naturally from the latter, we shall be able to recognise their propriety as well as those who first drew them from these facts: and we shall be the more sure of their justness, as no private interest leads us to prefer one opinion to another; and as we are disposed to receive the views which may afterwards occur, and of which we are ignorant, with the same eagerness that we adopt those which have been transmitted to us by our predecessors. In the present age, it is no longer in the defence of this or that opinion, that men of learning suppose their glory to consist:—but in giving proofs of good sense, in ardently searching after truth, and in frankly acknowledging their mistakes. To have arrived at this point, is to have made no small progress in knowledge.

Men of true philosophy, employed, as they are, in augmenting and confirming the real enjoyments of life, are always, beforehand, perfectly indifferent about the results of their inquiries. For of what consequence can it be to them, whether or not these results accord with received opinions? Their sole care is to ascertain their correctness; and this disposition of mind is still

further strengthened by the character of the prevailing methods of research, which, far from favouring the pretensions of vanity, are daily abridging its influence, by reducing the greater part of the studies from which society derives most honour and advantage to processes little more than mechanical.

Descartes, when he projected the reform of opinions, required, as an indispensable preliminary, that all those which were already current, should be considered as non-existent. He was desirous that their soundness should be determined by a new examination; and was even anxious that this examination should be more severe than before, as the habit of believing is with us generally equivalent to demonstration. The weak minds of the age were alarmed at this plan of reform. They imagined, that nothing short of the subversion of the foundations of human reason was aimed at. A very vain alarm, it must be confessed, as if the discussion of such a question could have been a just object of dread to any thing but error! and as if truth did not always appear more pure and attractive, after such an enquiry! It is its imperfect investigation alone, that deranges our ideas, and causes the mind to waver incessantly between scepticism and dogmatism. A good analytical method prevents us, it is true, from pursuing many useless researches;

searches; for, with the light which it affords, we have no difficulty in distinguishing those subjects which we shall never be able to elucidate by our inquiries: but, on the other hand, it places in a clearer point of view the truths which we obtain, and impresses them more firmly on the mind; and it is by such a method alone, that we are enabled to anticipate the means, by which future discoveries may be made and confirmed.

In medicine, as in other sciences, by repeating the examination of facts and opinions, we not only do not risk the loss of any known truths, but we necessarily discover many more that are involved in the observations already made, and the existence of which we, perhaps, did not even suspect. The real treasures of science consist in permanent and universally acknowledged truths, and not in the pomp and parade of systems; and are to be estimated by the accuracy, and not by the number or apparent extensiveness of our ideas. Even, when the methods of investigation are perfectly sure, we cannot too frequently repeat their application to the same objects. It is in this way that our acquirements gradually become more correct:—and nothing, certainly, would be more useful, than the occasional revival of those particulars of our knowledge even, which leave no traces of uncertainty in the mind.

SECTION XII.

What remains to be done for promoting the Reform of Medical Science?

BUT in what manner are we to proceed in medicine with this revival of our acquirements, or rather (supposing it to take place at a time when all conjectural systems shall be irrevocably banished from the science) in what manner are we to re-organize that mass of observations and experiments, of which these systems successively formed the basis, or centre of union, but which now remain scattered and deprived of any common tie?

All the sciences of observation are composed of facts, and each is distinguished by the general nature of those that belong to it. Human industry observes and collects these facts, and at times produces them by art: and reasoning connects them, sometimes, according to the order in which they present themselves, at other times, according to the order which seems best calculated for distinguishing their different relations. It classes them, unites them, or contrasts them, and determines their general or particular relations, according to their immediate importance, or according to the importance of the consequences that flow

flow from these relations, and of the subsequent views which they suggest.

Such is the progress of the mind, when we proceed in the proper path; and such is the path which we must always endeavour to follow. The theoretic branch of a science, therefore, should consist of the mere exposition of the connection, classification, and relations of all the facts of which this science is composed: it should form, as it were, their summary. If theory be not strictly confined within these narrow limits, it is no longer a systematic view of real objects, that it presents; but an assemblage of results unconnected with facts, and of vain illusions altogether devoid of foundation.

When we take a general survey of the observations in medicine that have been collected, down to the present time, the mind finds itself lost in their number and diversity. What, then, remains to be done? Unquestionably that which a person does who is placed amid a number of confused objects, and who is charged with the task of classing and distinguishing them, by shewing, in the very order of their distribution, the relations that may be observed to subsist between them.

In the first place, this person would mark the principal characteristic differences, those which are the most indisputable, and, at the same time, the most easy of observation; and these would

afford him the first means of division. Afterwards, he would return to each of these general classes, and by considering more attentively the objects which they comprehend, he would perceive some other differences among them, less obvious, but at the same time sufficiently distinct; which would serve him for the grounds of his secondary divisions. Thus, he would gradually proceed, classing, dividing, and subdividing, till he had assigned to every object its appropriate place.

It is, however, necessary to observe, that this place may be very different according to the nature of the end we propose to ourselves from such a classification. The same objects are not regarded in the same point of view in all the different sciences: in each, therefore, they may be found to possess, and, in reality, they do possess, among themselves, various specific relations; and, consequently, although the general method of classification be always the same, each particular classification must present differences in the order and connection of the objects.

To give an account of this order and connection; to explain and develope its principles; to point out all the relations of the objects or facts comprised in the system; to deduce from these relations all the consequences that may be directly obtained from them;—such has been the object
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of the labours of a few enlightened men in different departments of human knowledge; and such is the sum of what remains to be accomplished in medicine. In this manner, the sciences, or, at least, the works calculated to exhibit the most faithful picture of them, would be reduced, on the one hand, to complete and well digested collections of observations; and, on the other, to short theoretic expositions, in which mention would be made, in the first place, of the design with which these collections were, and ought to be, formed; and, secondly, of the direct conclusions that may be drawn from the different observations they contain.

Pringle used to observe, that, from the Greeks down to the present time, medicine was a science in which there was a great deal of reasoning upon a small number of facts; and that in future, on the contrary, there ought to be little reasoning upon a great number of facts. According to this method of reforming our science, the only one of which it is yet susceptible, the wish of this respectable empiric would be realized. We must have no more hypothetical views, no more fanciful systems: for it cannot be expected, that those theoretical opinions, which are not the evident and incontrovertible result of observations and experiments, will be retained in conjunction with the systematic exposition of these observations and experiments.

periments. Besides, would not this rejection prove the means of restoring and establishing harmony between the two principal sects which have divided the medical world from its infancy? Would not the more discerning minds of both parties recognise, in such an exposition, every thing which they agree in requiring in a good system, and none of those faults of which they mutually accuse each other?

It may, perhaps, be objected, that this would be, in some measure, to clip the wings of genius, and to reduce it to the servile employment of imitator, or composer of dry and uninteresting tables? But, in the first place, I am doubtful, whether in those sciences which most especially require attention and accuracy, it be so requisite to give what is termed *wings to genius*, or whether, as has been observed by a man* who can hardly be accused of timidity, it would not be better to add lead to its feet?

Besides, we may be assured, that genius and zeal will find sufficient scope for exertion in the accomplishment of this great reform; or, rather, the career which is opened before them is entirely new, and, in a manner, unlimited; and, afterwards, it will be almost impossible to fall into any very dangerous mistakes. Twenty or thirty

* Lord Bacon.

years would now be sufficient for verifying the observations that have been collected, (except, perhaps, those which relate to epidemical diseases): the same space of time would suffice for the repetition of all the different experiments that have been made, and for confirming the accuracy of the results.

After this first task shall have been accomplished, it will only remain to improve the practical methods. They will already have received many important improvements from these observations and experiments themselves. In the course of time, they will derive, from philosophy, all the exactness of which they are susceptible. All the interesting problems will at length be solved; and medicine will be placed on a level with the other sciences, in point of certainty; superior as it is, perhaps, to all of them, from the subject of its studies, and from the high importance of the different ends which it has in view.

SECTION XIII.

A more detailed Exposition of the Processes of Philosophical Analysis, as applied to Medicine.

BUT the mode of applying the method of philosophical analysis to objects so numerous and so various, as those which medicine embraces, cannot be sufficiently illustrated, by so general a view of the subject: it may, therefore, be necessary to enter into some further details.

To whatever branch of inquiry it be applied, the analytical method is always fundamentally the same. However, as we may consider the objects of research under different points of view, and may consequently discover relations of different kinds among them, the processes by which we recognise these relations present certain differences connected with the nature of our researches, the end to which they are directed, and the character of the ideas which they tend to suggest. Thus, for example, we may consider a body merely with respect to its magnitude, to its form, to the reciprocal relations of its different parts, to its situation with regard to one or several other bodies, and to the natural analogies or differences

ferences between them. The object of the analytical method, in such a case, is merely to *describe* this body with exactness, and to assign to it the place it should occupy, in relation to the objects which we view in conjunction with it.— This, therefore, may be called the *descriptive method of investigation*.

If our inquiries be not confined to these external qualities, to these relations of place; if we be desirous to become acquainted with the elements of which any body is composed; that is, with those particles of matter, by the intimate union of which it is formed; and if we separate its constituents in order to examine the nature of each, or, at least, the characters by which they are distinguished; the result of the investigation is no longer a simple description of the body. In order to study it in this point of view, we must decompose it; and, if we succeed in recomposing it, or in combining anew the different constituent parts which we had at first separated, the investigation is complete. It was by this method that the modern chemists were enabled to accomplish such feats; and it is it which ensures the glory and certainty of their labours. It may be termed the *method of investigation by analysis and recomposition*.

But the objects of our researches do not always present themselves to view at one and the same time. Frequently it is impossible to arrest them,

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and inspect them for any length of time ; as in the case of phenomena that succeed each other, and which may be sometimes independent of each other, and, at other times, connected in a regular and determinate order. There are also certain subjects of investigation that can be studied only by the changes which they undergo before the eyes of the observer ; from which we try to discover the preceding alterations they have experienced. In the study of these phenomena, our chief object is to determine whether or not any relations really subsist between them. In reviewing these changes, we endeavour to recognise the properties, with which the subjects of them have been endowed by nature : and when we have actually collected all the observations and experiments necessary for effecting either of these purposes, the result is a systematic history, in which the series of facts relative to the different subjects of inquiry unfolds itself in a natural order. This we shall term the *historical method of investigation*.

To conclude :—we may consider not so much the objects themselves, as the conceptions which we have derived from them. These conceptions may be contemplated in the same way as direct sensations ; that is, if they be sufficiently distinct, we may compare them, ascertain their relations, determine what new ideas each of them comprises, and thus deduce a long series of truths that natu-

rally flow from them, and are intimately connected together.

But, in such a case, I repeat, it is no longer the direct and material objects of our sensations, that form the subject of investigation: We now operate upon the products of our own minds, or, rather, upon the signs of these products, the only means by which we can represent them and submit them to examination. When these signs are well imagined, when they express accurately, and limit with precision, their corresponding ideas, we may always ascertain whether each of them really involve but a single idea, or comprehend several; we trace with ease the order of their connection; we proceed from one conclusion to another with perfect confidence; and as we advance, we may prove all the results by demonstration. These operations of the mind may be included under the name of the *deductive method of investigation*.

We have already observed, that the analytical method is always fundamentally the same in all its different applications. Of the truth of this remark, we may soon be convinced by a more attentive consideration of the subject.

Condillac, in order to convey a clear idea of what he understands by the term *analysis*, gives the instance of a person who arrives, in the night time, at a country house, with the environs of which he is wholly unacquainted.—In the morning,

morning, he supposes that the windows of the apartment occupied by this person are suddenly opened, and discover an extensive prospect of beautiful and diversified scenery: but, a moment after, the windows are closed; and the stranger is again immersed in total darkness. He has, perhaps, taken a rapid survey of all this rich and agreeable landscape; but certainly he can have acquired but a very indistinct idea of the objects of which it is composed. If, however, the windows be again opened, and remain so for some length of time, our observer will have an opportunity of renewing his examination of the landscape. After having received the first impression of the whole, his eye begins to distinguish the several parts; he examines them separately, compares them, and endeavours to determine their various relations; and afterwards, by combining them in a view which embraces them all at once, he recomposes the whole picture of which he certainly would have had but a very vague idea, if he had not begun with subjecting it to this sort of dissection. From this it is evident, that, in these successive operations, the aim and result of which are to give an exact description of the landscape, there is an *analysis* and *recomposition* of the subject; that, in the judgements which we form of the relation of the different parts, there are deductions of ideas and certain consequences that flow from them;

them; finally, that, if the examination of the landscape be continued long enough to admit of all its parts being illuminated in different ways by the sun, we observe a series of changes in their external appearance, the exposition of which seems to belong to the *historical method of investigation*.

On the other hand, the historical and deductive methods exhibit, in the processes of which they severally consist, various circumstances perfectly analogous or similar to those which more particularly belong to the other branches. For not only in the method by deduction may there be found descriptions of particular objects, and decompositions and recompositions of ideas; but it frequently operates on results which the historical method of investigation is alone capable of affording: and not only may this last-mentioned method present different descriptions and deductions, but it is also continually analysing and recomposing the objects, or the phenomena and changes, which it endeavours to connect in a natural order, or of which it furnishes correct representations.

In another passage of his works, Condillac gives rather a different view of the process of analysis. Suppose we are desirous to study the construction of any machine, for instance, of a watch. Of all the different ways of effecting our purpose the most sure and simple seems to be, to take it carefully to pieces; to observe attentively the form

and other sensible qualities of each wheel or part; and afterwards to put these different parts again into their proper places, after having duly ascertained their points of union or contact. When we have gone through all these operations in such a manner as to convey to the mind an accurate idea of each part in particular, and of the whole machine in general; we may be said to have acquired a proper knowledge of its construction, and are able to estimate, and even to foretell, all its movements.

The reader will easily perceive, that we have here described the method of investigation employed in chemistry—the *method of analysis and recomposition*, applied, it is true, to the different wheels or other parts of a machine, and not to the minute elements or constituent principles of a body. But is it not sufficiently obvious, that it is the elements of a machine, or the parts of which it consists, that, by their particular structure and combination, render it capable of performing a certain series of movements; in the same way that the wheels of a body, considered in a chemical point of view (that is, the causes which determine its specific properties, and which produce the various phenomena it exhibits when brought into contact with other bodies) are the elements that enter into its composition, its constituent principles,

principles, or the simple bodies, which its examination has enabled us to discover in it?

To conclude: in several of his works, and especially, in the *Langue des Calculs*, Condillac maintains, that the process of *analysis* is only a series of translations of ideas, or of the propositions upon which our researches turn; that these translations enable us to proceed from one identical proposition to another; that, accordingly, when we make any discovery, we necessarily deduce it from those which we have already made; and that our ignorance is involved, if we may say so, in our knowledge: and as, according to Condillac, the perfect identity of the propositions or ideas is preserved in each successive translation, and remains the same from the first to the last, he thought himself justified in laying it down as a principle, that the *known* and *unknown* are one and the same thing; a conclusion which, no doubt, appears very singular, but which cannot be controverted by those who believe that there is a *perfect identity** in the transpositions of analysis, or in the successive translations of the propositions of which it consists.

This last description of analysis, which we have denominated the *deductive method of investigation*, should be displayed and exemplified in

* Which certainly is not exactly the case.

every system of language. For languages are properly framed, only when this method guides and directs their formation ; and can only be applied with certainty to the investigation of truth, when it constantly governs their employment. The analysis of algebra, properly speaking, is merely a particular application of it : but the construction and signs of this language are the more perfect, and the operations which are effected by its means the more certain, as it considers the objects of research in one simple point of view ; and as it regards only one species of relations, the data of which are always invariably determined. If we consider the manner in which Condillac expresses himself on this head, in the *Langue des Calculs*, we may be led to think, that he had ended by reducing the whole art of reasoning to the *method by deduction*, or to that particular mode of reasoning, which the ancient logicians termed *sorites*. If this were a proper place for entering into an examination of his arguments, it would not, perhaps, be very difficult to shew, that his opinion is far from being devoid of foundation.

SECTION XIV.

Application of these Methods of Investigation to the different Objects of Medical Research.

WHEN we delineate or determine the figure of a plant, of its stalk, its flowers, its seed, and its roots; the size and relative situation of its parts, and the differences in their colour: in short, all the external circumstances that distinguish it; we follow the *descriptive method of investigation*.—Several descriptions of this nature conjoined, and the comparison of the different plants, whose character they establish, enable us to discover certain relations between them, by means of which we may arrange them and class them in a suitable order. In this way we form a systematic table, in which all the objects are connected by their common character, and thence become readily associated in the mind. But, however extensive their number may be, such a table is still, in itself, nothing more than the product of the descriptive method of investigation.

We must, however, observe, that, to be complete, the botanical description of a plant should include the relation of the different changes it undergoes, or of the different phenomena it exhibits

hibits at the different periods of its existence, and that, consequently, the historical method of investigation forms part of such a description; in the same way that the descriptive method is, in its turn, combined with the historical, when we have to relate the facts from which the properties of a plant are deduced, and with the method of chemical analysis, when we are desirous to know the elements of which it is composed. I here use the term chemical analysis, in its most confined sense; for it is with vegetables as with animals;—we may decompose them, but cannot form them anew. We cannot even recompose their least important parts:—a proof that there enters some unknown element into their composition, or that it depends on certain processes of nature, which observation has never been able to detect, and which art is utterly incapable of imitating.

A systematical table, which represents to us the form, the colour, and the situation of an organ, its relations of vicinity, of distance, of resemblance or difference, with respect to other parts: such a table, I repeat, is the product of the descriptive method. You point out, for example, the situation of a muscle; you determine its size and the space which it occupies, the direction of its fibres, the insertions of its tendinous extremities; you describe the structure of the heart, and trace the course of the vessels of which it forms the centre;

you demonstrate the brain and spinal marrow; and from thence, as from a common trunk, you follow the course of the nerves, and mark their distribution in the various organs to which they communicate animation and feeling: still all this is but a simple description: and in your proceedings you resemble the geographer, who contents himself with delineating the topography of a country, without reviewing the physical changes which it may, in the course of time, have experienced, and without relating the political events of which it may have been the scene, or the revolutions which may have successively distracted its inhabitants.

But if you attempt to explain the functions of this same organ; if you endeavour to determine the movements which this same muscle performs, or those to which it contributes; you then follow the *historical method of investigation*, and, by its assistance, you compose your table: in the same way as when you are desirous to discover what simple bodies already known, enter into the composition of the part under examination, you can only attain your end by means of the chemical analysis; and the conclusion to which you are led can be just only in as far as it is the direct and necessary inference from the facts displayed and confirmed by this investigation, and as the results of

the operations employed are summarily expressed by it.

A good historical investigation should carefully and attentively follow the whole series of phenomena or changes which the body under examination exhibits: it should detail them in the order of their succession, and should describe them with all the characters by which they are distinguished: it should endeavour to discover the kind or degree of influence which they exert upon each other, and ascertain, if possible, the principal phenomenon to which all the others may be referred, and on which they all evidently depend.

To be able to give an accurate account of the functions of the stomach, it is necessary, in the first place, to have observed, that it receives the food within its cavity; that the nature of the food is there changed, or that when it passes out of it, after a certain length of time, it exhibits new characters and properties. These changes bear the name of stomachic digestion. This digestion is, therefore, the peculiar function of the stomach: and, if we have ascertained the conditions requisite for its due performance, the circumstances that tend to favour or impede it, the agent or agents that nature seems to have particularly destined for its accomplishment, we shall have acquired an idea of the functions of this organ,

organ, which will be just and correct, in proportion as all the principal phenomena, connected with these functions, shall have been observed with more or less accuracy.

But whatever uncertainty may attend the investigation of that series of actions which constitute the life of animated beings, the study of those changes which disease occasions, is not less uncertain, obscure, and difficult: and as the mistakes into which we may fall, with regard to their cause, that is, to the principal phenomenon on which all the others depend, or by the influence of which they are modified; as these mistakes are seldom confined to theory, but, by furnishing erroneous views of the treatment of diseases, are often productive of the most pernicious consequences in practice: they are certainly of a much more serious nature, than errors which relate merely to the simple organic functions; as the latter, for the most part, serve only to furnish ridiculous explanations of facts, and as the indications of cure, that have been too often rashly deduced from them, are, in general, much more easily corrected.

The historical investigation of a disease should be conducted with the greatest exactness; and, in attempting it, we cannot be too careful to divest ourselves of all prejudice, of all conjectural views, and of every idea that is not connected with the

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phenomena

phenomena under examination. We must observe the things that are, and not figure to ourselves imaginary existences. In reviewing the subject, we must describe what we have seen, without introducing into the relation any of the conclusions or suppositions we may have thought ourselves entitled to deduce from it; and the more simple and exact the recital is, the more correctly will the order, duration, distinctness, and other characteristics of the symptoms be found depicted in it; the more perfect, too, will be the investigation, the more solid and simple will be the results or conclusions it may afford, either directly and by itself, or indirectly and by its comparison with other descriptions that have been formed on a similar plan.

Such, in fact, are those admirable histories of particular diseases which Hippocrates has left us, and which the ancients very justly termed the "*most chaste contemplation of nature.*" From these descriptions, which display so much accuracy, and which place all the facts in so clear a point of view, the genius of Hippocrates found little difficulty in deducing those beautiful and extensive views respecting the influence of the seasons, the variations of the atmosphere, and the effects of these variations on different epidemical diseases, and respecting the laws which regulate the course of particular disorders, all arranged in
genera

genera and species, in the same way as we distinguish the external characters, or certain regular series of phenomena, in the different species of animals and vegetables. Such, too, are the histories of some diseases, drawn by the moderns, in a much more imperfect manner, in my opinion, as far as regards their accuracy, and, particularly, as far as regards the art of delineating their most characteristic, and at the same time most delicate features; but the perusal of which is, nevertheless, more instructive in some respects, on account of the learned details of curative means they contain. We must also acknowledge, (what indeed no one can deny) that such of these histories as afford the most solid information to the student, are those, the authors of which have adhered most closely to the method of Hippocrates, in the exact and faithful description of the phenomena observed: and every one who combines, in any degree, the habit of observing diseases with that of reading with reflection, must very soon perceive, that the scenes which nature displays to view, are very far from being always the same as the imagination depicts them; that we ought to view with mistrust the systems, which, at first sight, appear so well devised and arranged; and that those, the justness and accuracy of which are most unquestionable, yet discover certain breaks in the concatenation of the objects they embrace; and that, perhaps, there

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is not a single one, the harmony of which, according to our natural manner of regarding things, is not deranged by some apparent irregularity.

The method of chemical analysis may be applied to all the bodies of nature. Whatever be their characters and properties; in whatever point of view we may otherwise chuse to consider them, still we may always try to discover the elements, by the more or less intimate combination of which they have been formed. When, after having effected the decomposition of a body by this analysis, we can form it anew in all its parts, by reuniting its products, and placing them in circumstances favourable to its recomposition, we may say that the analysis is complete: We know the elements of that body; we know the bodies which have not hitherto been decomposed, of which it is itself a composition. The light which this powerful instrument, handled, as it has been, in so masterly and sure a manner, by the French chemists, has already reflected upon the operations of nature, and the more brilliant light which it bids fair to diffuse at no very remote period, will prove a more formidable obstacle to the machinations of quackery, than all the discussions of philosophers, and all the raillery of wits.

But chemical analysis cannot always attain this ultimate degree of proof. Often, after it has effected the decomposition of a body, however careful

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ful we may have been to collect and to preserve all the products, it is in vain that we attempt to reunite them. This is found to be the case, not only when we operate on organized bodies, or on animal or vegetable substances; but also when we operate on bodies to which life has not imparted its distinguishing characteristics. In these unfavourable circumstances, the results of the analysis are supported only by a greater or less degree of probability; and though, in some instances, this probability may be equivalent, if we may so express ourselves, to certainty, yet in the greater number of cases, time and experience are required for establishing the accuracy of the conclusions. This is more particularly the case, when these conclusions are applied to explain the phenomena of life in all its different degrees, and when they suggest the employment of certain means of action on the living system.

The *method of analysis and recomposition* is often guided by the descriptive method, or at least, it frequently borrows the materials on which it operates, from it. It may, too, be elucidated, and directed to new discoveries by the historical method; but, in its turn, it often becomes a necessary guide to the latter. Finally, it furnishes the deductive method with more certain grounds of proceeding, and with subjects of reasoning that
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are easily represented by clear, simple, and precise terms.

The *method of deductive investigation*, again, may borrow the subjects upon which it operates, from any one of the other methods; and, on the other hand, it may be itself combined with their various operations. As it is employed upon ideas, or, rather, upon the signs that represent them, provided these signs be well formed, and it deduce merely theoretical conclusions from them, it proceeds with perfect certainty; and that, too, necessarily: for the signs of ideas represent, of course, only such conceptions as are included in them; and if they be exact and regular, they will recall them distinctly, and circumscribe them with precision.

This method of investigation has for its object to discover, if one idea be involved in another, and, by a series of translations and reasonings, to arrive at conclusions, the first idea, or original form of which did not enable us to ascertain their certainty, or even to give us the most distant notion of their acquirement. Ideologists very aptly compare these successive evolutions of ideas to a number of little boxes inclosed within one another, and the first link of the chain of reasoning to the principal box that contains all the rest. You open this, and draw out of it the second; from the second you extract the third, and so on;
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till the minuteness of the remaining ones prevent you from easily laying hold of them. Condillac has made use of the same comparison, which proves, that, regarding all the processes of analysis as belonging to one and the same method, he described it in different points of view, according to the objects to which it is applied, or according to the various lights in which we may desire to consider them.

We have just observed, that the deductive method of investigation, when its language is exact and regular, and when it does not exceed the bounds of theory, is able to proceed in a sure path, and to impart to its conclusions a perfect certainty. This certainty, however, relates only to the received acceptance of the first idea from which we proceed, or of the signs that represent it, and which form the first link of the chain of reasoning: for if the subject of this idea be imperfectly or vaguely expressed, the series of reasonings with respect to it may be complete, and yet the conclusions will be found to be extremely erroneous. Hence, the operations of the deductive method of investigation, when applied to quantity or magnitudes, (which are always capable of being reduced to quantity) are wholly exempt from errors. The signs which they adopt have such a degree of precision, that all confusion of terms is necessarily excluded. The ideas, which these signs represent

represent, refer to simple objects, which can be considered only in one point of view; and of which we must give either a just representation, or none at all. To conclude: the objects of these ideas result solely from the operations of the mind, and are identified with the ideas and the signs that express them and determine their relations. When we are able to circumscribe, with the same precision, the other objects of our researches, and to give to the language employed in their study, or in the delivery of the ideas it affords, the same degree of clearness and exactness, the certainty of our conclusions is as complete as in the investigations which relate to the properties of numbers or magnitudes.

But, from the very nature of our intellectual constitution, from the nature of our wants, and of the connections which our peculiar mode of perception establishes between us and external objects, this complete certainty, in whatever way it be obtained, can exist only with respect to purely theoretical views. The moment that we attempt any practical application of our knowledge, we are guided only by certain conjectures, founded upon more or less solid data, and are restricted in our reasonings to calculations of mere probability.

The calculations of probabilities, are, in general, of two different kinds. Sometimes, the truth
lies

lies between two known extremes, it may be situated in all the points of the intermediate space: but it is necessarily contained within these limits; and we may often approach to its discovery by certain methods which tend to circumscribe the field of uncertainty, although, otherwise, it may still be impossible to arrive at any very precise conclusions. At other times, the calculation collects the more or less numerous or convincing arguments in support of some particular opinion or conclusion; and, after their strict examination, we become more or less entitled to consider this conclusion or opinion as the truth.

When Archimedes, wishing to determine the ratio of the diameter of the circle to its circumference, gave the proportion of 7 to 22, he was sufficiently aware, that this ratio was only an approximation to the truth. Metius, by giving the ratio of 113 to 355, lessened considerably its uncertainty. Finally, Wolff and Ludolph Van Ceulen have approached nearer to the exact definition; and others may come nearer still, without any one ever being able to reach it. This, then, may serve as an instance of the first species of calculation.

To give an example of the second: we have no certain proof that the sun will rise to-morrow, or that the ensuing night, like those that have

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preceded

preceded it, will be followed by day. Nobody, however, can entertain any doubts on this point; and we look forward to the day-light of to-morrow, with such perfect confidence, that all the arrangements of our life are governed by this expectation. In what manner, we may ask, is this belief so firmly established in our mind? Does it not entirely depend upon experience, upon that multitude of facts which testify, that, in the revolutions of the heavenly bodies, a certain order prevails; and that the phenomena which they have so long continued to exhibit, must continue to manifest themselves in future? Every year, every month, and every day, adds to this probability. The man who saw the sun rise for the first time, if he had no previous notion of the course of this planet, would certainly have little reason to think, that it was about to ascend to the highest point of the heavens; and when, in the evening, he observed it disappear in the ocean, he would have as little cause to believe, that it was ever again to return. But when the experience of ages has proved to us, that this order is invariable; when all the memorials and traditions of past ages attest, that it has never been interverted, we can entertain no doubt of its future continuance: and the more the facts that compose the proofs of this order are multiplied, the more convincing does

does our experience become, and the more certain the conclusions which we deduce from it appear.

The former species of calculation relates to very simple subjects: the data upon which it is founded are precise and determinate: and it refers to matters of pure theory. The latter relates to an event, easy to observe, accompanied by a small number of circumstances subject to little variation, and with respect to which the conclusions are liable to no ambiguity in their principles. But it frequently happens, especially when the problem refers to the practical employment of our acquirements, that the data of the calculation are very numerous and various: we find it a very difficult matter to collect them, and to ascertain their comparative importance, or to express them by determinate quantities: in particular, we find it very difficult to discover, whether we have really fulfilled this condition; and, in such cases, the interval between us and the truth becomes more considerable, or, in other words, the probability that we have attained is weaker.

Of this we may take examples from the science of medicine itself; and, in particular, from the practical part of it, in which the objects are both more numerous and more liable to variation, and in which we consequently experience the greatest difficulties in collecting and determining, with precision, the different data of our calculations.

When it was first observed, that Peruvian bark cured intermittent fever; this effect, after having been well ascertained in a certain number of cases, was undoubtedly a very brilliant discovery; and there was reason to think, that medicine had made a very important acquisition.— But in every new case, in which its employment appeared to be indicated, a prudent physician had to weigh carefully those circumstances which might oppose its exhibition, or the presence of which might, at least, considerably modify its action. The age, the temperament, the previous habit of body of the patient, the season of the year, the nature of the prevailing epidemic, would render the arguments in favour of its administration, and the hopes of its efficacy, still more equivocal. For numberless observations and experiments are required for determining, with sufficient certainty, in what circumstances it is always beneficial; in what other circumstances it may prove injurious; what are the combinations with other remedies, or the modifications which its employment frequently demands: and when all these questions have been solved, and all these difficulties conquered, the use of bark, in every particular case, must be decided by a quick and nice calculation; which should recall to the mind all the important results of former observations and experiments, and from the comparison of the latter

latter with the different circumstances in the state of the patient, should enable us to discover the particular indication of the remedy, and the proper mode of its employment.

Ipecacuanha provokes vomiting, and jalap purges. We have the more reason to ascribe to them these properties, as we have had more frequent occasion to observe their effects; and we have the less reason to doubt the emetic powers of the one, and the cathartic virtues of the other, in the new cases in which they may be employed, as these cases are found to exhibit fewer peculiarities, either similar or analogous to those which, after a certain number of well-established trials, must be regarded as capable of impeding the action of the remedies in question.

When we desire to determine the dose of those medicines, that are indicated by the character of the disease: when we wish, for example, to determine the quantity of blood which it is advisable to abstract in an inflammatory affection, the age, the temperament, the strength of the patient, the seat or violence of the inflammation, the season of the year, the general tendency of the diseases prevalent at the time to terminate by such or such a crisis; all these circumstances, weighed and compared together, should give for result the quantity sought for; which, however, we are able to ascertain only by approximation. When we

are desirous to determine the dose of an emetic, or of a cathartic, it is between two extremes, from *plus* to *minus*, that this dose is to be discovered. The latter extreme, will express the mark below which the remedy has no effect whatever; and the former will indicate the limits beyond which it has been never employed without inconvenience. In this latitude, the desired-for measure is necessarily placed; and we shall approach the nearer to it, in proportion as all the particular circumstances, which may produce a variation of it, in the case in question, shall have been ascertained with greater care and precision.

I will not, however, extend the investigation of this important point any further, as I wish to confine myself to general principles, and do not propose to deliver a complete collection of rules for the study of medicine. The subject, no doubt, is well worthy the attention of the most enlightened inquirers; but no one can discuss it in a cursory, and, as it were, casual manner. We must, in particular, guard against the belief that we have effected our object, or even understood all its importance and extent, when, for this method, there is given a systematic catalogue of books, like that which we owe to the learning of Boerhaave, and of his commentator, Haller*.

* See note [K].

SECTION XV.

Of the Application of the Analytical Method to the Business of Medical Education.

It is sufficiently evident, that the views which should direct the reform of medical science are the same with those which must govern and regulate its instruction. They alone can supply a good plan of education, and a good system of lectures in every branch of it. One very essential point to be attended to, is always to present to the pupil the objects in their most natural order, that is, to begin with the first or most easily known, and, by their assistance, slowly and gradually to proceed to those which require more profound attention, more skilful examination, or, perhaps, even new methods of research. It ought to be the study of the teacher, to develop the ideas of his scholar, in the order of their formation, or in the same order in which the objects conjunctly, and their parts in detail, are presented to our view. And the pupil, in particular, after having seized the chain that unites them, must review it from the first to the last link, taking care not to pass over any of the intermediate ideas which the mind does not directly, and, as it were, necessarily suggest.

Since young physicians receive their proper education, not by reading, but at the bedside of patients; not from the dull rules of a school, but in the presence of nature herself,—in other words, from the inspection of the various subjects of their future labours; the influence of the master is chiefly evinced in the method of observation which he recommends to them; in the manner in which he himself considers the subjects along with them; in which he teaches them to investigate nature, and in which he directs their attention and first practical efforts. The professor, from his chair, delivers, often in vain, the most interesting truths, in the best language: The minds of his hearers, absorbed in passive attention, retain but a faint recollection of his precepts. But those which they have formed to themselves under his guidance, those which they have discovered and recognised by a series of active associations, will remain for ever impressed on their memory. By these means their acquisitions become not only more durable and substantial, but they have also some degree of originality, and are more analogous to the turn of mind peculiar to each individual; and the practice of deducing them always from the objects themselves, excites an aversion to every other mode of obtaining them.

We must not, however, run into the opposite extreme, and carry the practice of this method to
pedantry;

pedantry; for though it is, no doubt, the best and surest way of forming our ideas, yet it is not the only one. Very often it happens, that we receive our sensations by chance; the scattered ideas which result from them are confusedly impressed on the memory, and remain dormant, till analogous sensations occur, which revive them and become associated with them, and till both become connected in more or less general, and more or less regular classes. Then commences the labour of subjecting to examination this arrangement, which is often, at first, entirely accidental; and it is then only that men of genius, by strictly investigating all their particular ideas separately, are able to determine their natural order, and the place which this order assigns to them; and conclude by resolving them all into a few general principles that serve as a common centre of union.

Besides, if, in conducting the business of education, it is generally found advantageous to begin with facts, and to proceed by degrees to conclusions: it is also sometimes expedient, first to deliver the conclusions, and to confirm them by the indication of the principal facts; reserving it in our power, to return to the latter, in order to explain them in detail, when it is necessary to demonstrate the proposition more methodically. For, independently of the inevitable loss of time, which the method of invention occasions, when employed

employed strictly and indiscriminately in all cases; —a loss which is important in many respects, and which is far from being always compensated by the certain advantages resulting from its use; it also frequently happens, that the lessons of the master assume an uninteresting, and perhaps, repulsive character, from the uniformity, and we may even add, from the very facility of the process. The attention of the pupil, which no striking object, no difficulty animates, languishes and soon becomes extinguished, by the very means that should facilitate its exercise and operations: while the professor, who sometimes presents on a sudden ideas that are unexpected, and remarkable for their grandeur or their novelty; who, from time to time, neglects a few intermediate observations, in order to excite the interest and stimulate the curiosity of his pupils; and who, according to the nature of his subject, passes from analysis to synthesis, and from synthesis to analysis, taking care to correct, if there be any room for doubt, the more bold deductions of the former by the more sure and regular proceedings of the latter; such a professor will preserve the minds of his pupils in a state of more real and permanent activity; he will impart a more powerful impulse to their thoughts, without running the risk of communicating to them a vicious direction; and his method, perhaps, will prove also the best adapted

to the nature and operations of the human understanding.

It does not seem to me, as has been too generally believed, to be owing to any faults of style, that the works of Condillac have not, from their first appearance, obtained all the success which they deserve. His works are written always with purity, often with much elegance of language, and sometimes with considerable animation and effect: but the luminous reasonings of this excellent philosopher prepare and reserve, to the reader, neither surprises nor difficulties; each paragraph announces the following; and the first sentence anticipates all the rest. The trouble of the reader is spared to such a degree, that he concludes by taking none at all; and the author thinks so well for him, that he soon comes to think no longer for himself.

These reflections are not, perhaps, misplaced at a time when all the friends of learning celebrate, with one accord, and with so much reason, the excellence and superior utility of the analytical method; when all those who interest themselves in the improvement of the sciences and the advancement of their study, regard it as the only light which can ensure and accelerate the progress of the human mind, and rescue it for ever from the chaos of hypothetical opinions; as the only means of cultivating or employing our intellectual faculties,

ties, which is capable of introducing habits of just reflection, not only in all the studies of the enlightened and thinking class of mankind, but in all the labours of the artisan and manufacturer, —in short, in all the ideas, propensities, and actions of man, considered as a social being. I entirely coincide in this opinion, and participate in these bright hopes. But the true analytical method proceeds by all the paths that can lead to truth. The most sure in each particular case is that which it prefers. Frequently, it collects the data carefully, in order to deduce the conclusions: sometimes, it fixes upon the results, confident that the data will spontaneously arrange themselves around them. Both ways of proceeding are familiar to it; and for the most part it follows both at the same time. Those who think that it should always pursue the track of invention, will have formed but a very imperfect idea of its nature. If they attempt to cramp the energies of genius, or to limit the sphere of its activity, they will end by deadening it and extinguishing it entirely.

I shall here conclude the exposition of these general views, which certainly, I repeat, would still require to be much further developed: but the extent and importance of the subject have already led me far beyond the limits which I had prescribed to my pen; and I feel it necessary to return once more to the consideration of some particular branches of medical instruction.

CHAP.

CHAPTER IV.

Particular Considerations relative to various
Branches of Medical Research.

SECTION I.

On Anatomy.

BEFORE the time of Hippocrates, anatomy can scarcely be said to have existed. Galen, indeed, affirms, that the Asclepiades, to whose family the exercise of the medical art was for a long time confined, taught their pupils the structure of the human body by the indirect method of dissections of animals. Their instructions, he says, began from their earliest infancy, and practice rendered the subject so familiar to them, that it was unnecessary to deliver the demonstrations in the form of written lectures. But this opinion, delivered at random like many others of the same author, is formally denied by Chalcidius, an ancient commentator upon Plato. The latter affirms, that Alcmeon, the disciple of Pythagoras, was the first who dissected the bodies of animals. It is, therefore, to a much later period that we must refer the practice which Galen ascribes to the ancient physicians of Cos.

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In Hippocrates, it is true, we meet with various descriptions of the organs of the human body, which were probably drawn from these incorrect analogies: but they only serve to prove, that the structure of animals itself was at that time very imperfectly known; for if the subject had been studied with the least attention, several gross errors would have been avoided, which Hippocrates seems to have adopted with the greatest confidence. His Treatise *On the Heart*, indeed, is sufficiently accurate; and his enthusiastic admirers may, perhaps, perceive in it a sort of obscure anticipation of the discovery of the circulation: but it must be acknowledged, that this great man was a very bad anatomist. The only parts, with the structure of which he seems to have been accurately acquainted, were the bones; it being always an easy matter to procure human skeletons.

Wounds or diseases, which laid bare the viscera or other deep-seated parts; the practice of embalming the bodies of the dead, which, from time immemorial, prevailed in Egypt; finally, the fortuitous discovery of human bodies, which had been thrown ashore from the rivers or ocean, which the precipitate flight of a vanquished army had left upon the field of battle, or which unforeseen accidents had left at the mercy of wild beasts, and birds of prey, were the only circumstances

stances that could have furnished physicians with a few transient and often dangerous opportunities of studying the true anatomy of the human frame. But the prejudice, which on the one hand, attached the stigma of sacrilege to the over-curious examination of the dead, and on the other hand, connected the idea of pollution with the mere touching of their bodies, opposed an almost insurmountable barrier to the progress of this science. Aristotle says positively, that, in his time, there had not been any dissection of the human subject.

It was not till the age of Herophilus and Erasistratus, when the diffusion of knowledge had already considerably weakened the influence of these superstitious scruples, that anatomists were able to study the organization of man, upon man himself. The prejudice against anatomy was of longer duration among the Romans, who were more ignorant than the Greeks. Pliny says, that the laws forbade the inspection of the human viscera.—However, the desire of self-preservation had a more powerful influence upon the minds of the Emperors, than the respect for public opinion; for they frequently permitted the physicians to dissect the bodies of criminals or of captive enemies. Under Marcus Aurelius, the bodies of the Germans were consigned to them by an express decree. Galen, who relates this fact, had it certainly in his

his power to dissect several of these bodies, and we might suppose that he would have been eager to embrace the opportunity. Yet it appears, from the perusal of his anatomical descriptions, that he had performed no dissections, but upon the bodies of different animals, and particularly of a great number of apes, which he preferred, on account of their resemblance to the human body: and although his anatomical writings are very extensive, and full of excellent observations for the time in which they were written, there is reason to believe, that he himself had never seen, in the human subject, the organs which he describes with the greatest minuteness.

The anatomy of Galen reigned with exclusive sway till the time of Vesalius. His errors, which it was certainly much more easy to prove in this department of the science, of which all the objects are palpable and determinate, than in that of practical medicine, where they are so various, delicate, and changeable; his errors had become part of the creed adopted in all the schools of medicine. No one dared to controvert them; no one dared even to appear to suspect that they were errors; till, at length, Vesalius, treating this servile idolatry with the contempt it deserved, boldly attacked Galen and his superstitious adherents. To him medicine was, in a great measure, indebted for the bold and more solid advances
which

which it then began, and which it has since continued to make, even amidst its frequent deviations from the proper path of research. But it is to anatomy in particular that he has rendered everlasting services; it was by the successful courage and meritorious exertions of this celebrated man, that this science was freed from its fetters, and that the way was paved for all those brilliant discoveries, which at present give to the practice of surgery so high a degree of certainty.

In fact, from this time forward, the progress of anatomy has been rapid and uninterrupted. The discovery of the circulation of the blood; that of its variations in the adult and in the fetus; the discovery of the chylopoetic vessels, of the thoracic duct and receptacle of the chyle; the demonstration of the vascularity of the different organs of the system, by means of the injections of Ruysch; the structure of the conglobate glands; the partial discovery of the course and functions of the lymphatics; the physiological and pathological researches respecting the cellular texture; the splendid but too often inaccurate experiments on the parts endowed with sensation and irritability; the more exact description of the absorbent and glandular systems, and the more accurate determination of their real functions;—such are the fruits of the indefatigable zeal of a number of industrious men, who, by their unremitting labours, have succeeded

in advancing the anatomy of the human body to the highest pitch of improvement, perhaps, of which it is susceptible.

This science, in so far as it is connected with the business of medical education, presents different points of view in which it deserves to be considered. 1st. It forms part of the physical description of the system, and, as such, is comprehended in natural history properly so called. 2dly. As the basis and ground-work of all physiological illustrations, it forms a necessary branch of the science of the animal economy. 3dly. While it serves as a guide to the art of physic, and in particular to the surgical department, it seems to be now quite inseparable from practice, the success of which it frequently ensures.

If we consider it in the first point of view, anatomy must be referred to the descriptive method: it forms a sort of curious, but inanimate topography. Viewed in the second light, it assumes a more interesting character, and approaches nearer to medicine and surgery. While in the last, it is connected with the various objects of their studies; and is associated with the greater part of their labours, although it certainly does not always perform the important office that is commonly ascribed to it.

Anatomy, considered as description, has, in a manner, no limits. According as the most striking objects are elucidated, others less obvious present

sent themselves to view; new worlds are opened before us; and the boundaries of the horizon recede at the moment when we suppose we have reached them. However, in order to make further discoveries of importance in anatomy, it would be requisite to invent more perfect instruments, or some method, which, like that of injection, would enlarge and display those parts, the structure of which cannot be detected by our present means of investigation. Thus, for example, the minute organization of the brain appears hardly capable of being ascertained either by the scalpel or by our common microscopes, or by injections, such, at least, as are now commonly used. But, luckily, this delicate part of anatomy is rather an object of physiological curiosity, than of medical utility. Although we should by no means overlook it; although, even, it is not impossible that we may one day derive some advantage from it, it is at present wholly useless; and we are inclined to believe that it will always remain so.

Though physiological anatomy be more limited in the sphere it embraces, than the anatomy of description, yet it is still less so than what may be called therapeutic anatomy. The illustration of the different vital functions, as founded upon the mere structure of the organs which perform them, has already made some progress, and bids fair to make further advances. But we are less in want

of anatomy, properly so called, than of a good collection of observations upon the living system. We are well acquainted with the organization of several parts of the body, respecting the uses of which we are intirely ignorant. The experiments that we might be disposed to institute in order to ascertain the functions of these parts, are in general very difficult; some of them, even, appear to be impossible, at least with our present means of research: and with respect to that branch of anatomy which I have termed therapeutical, and which admits of frequent application to practice, it is confined within very narrow limits. The contrary opinion, which has become very prevalent, originates, perhaps, both from the prejudices of ignorance, and from that sort of learning which is acquired by laborious and repulsive studies. The structure, situation, and connections of the different viscera, the distribution of the principal trunks of the blood-vessels and nerves, the form and disposition of the bones, the insertions of the muscles, the expansions of the tendinous membranes, and, perhaps, also some other particulars equally easy to learn, ought to be all familiar to the physician. Perhaps, we may venture to add, that, even in surgical operations, a minute knowledge of anatomy is very rarely of use. For a confirmation of this assertion, I might with confidence appeal to the candour and discrimination of the most enlightened surgeons.

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Each demonstrator has his particular arrangement and method of instruction; and every method and arrangement is good, provided it be clear and distinct. When our object is merely a simple description of form, it is of little consequence, at least in general, whether we begin with one part or another. In studying geography, for instance, we may set out from any point, or begin with any country that we please. It is sufficient if the memory retain a correct idea of the places and their respective situations. The case is much the same with anatomy. However, the manner in which nature displays the objects of its researches is not altogether fortuitous; and, perhaps, if demonstrators took the trouble to observe it more attentively, they would find, that they are not at liberty to invert it, when they lay these objects before their pupils. Winslow, in his *Exposition de la Structure du Corps*, seems to have paid some attention to this natural order in which the objects of the science present themselves to view. Lieutaud, who was a man of sense and even of some genius, though, it must be confessed, his two compendiums of *Materia Medica* and *Practical Physic* are below mediocrity, carried his views still farther. It was his object, in the *Historia Anatomico-Medica*, to have described the organs of the body, precisely in the manner in which they would have been examined and described by

the inventor of the science himself, supposing that one man had been capable of accomplishing all the labours and making all the discoveries appertaining to it. The design was beautiful; but in the execution of it the author completely failed. Perhaps, some able anatomist, more familiar with philosophical methods, may yet take advantage of it; in which case the merit will be almost entirely his own: for in such matters it is very easy to project—the whole difficulty lies in the execution*.

In the mean time, we may venture to affirm, that demonstrators will find themselves successful in their instructions, in proportion as they adhere to the method which this view of the subject suggests, and which itself forms only a branch of the general method that we have so frequently had occasion to mention.

The most interesting part of anatomy unquestionably is that which has for its object to determine, in organic lesions, the cause, as well as the seat of diseases:—This forms the true anatomy of medicine. It rectifies many errors, dissipates many prejudices, and becomes the more useful to practice, that it frequently endangers the reputation of practitioners. Who does not perceive, at first

* When the above was written, the *Traité d'Anatomie* of my friend Boyer had not yet appeared. In the point of view to which I have just been alluding, the labours of this eminent surgeon have left nothing to desire,

fight, all the advantages to be derived from the exact comparison of the phenomena of disease, or of the variations which it may have experienced, with the state in which the parts that appear to have been the seat of the complaint, and often those which had shewn no signs of disorder, are found after death? Who does not see, that physiology as well as the practice of medicine, may derive a number of important observations and interesting results, from such an investigation?

However, if nothing be more certain and evident, than the state in which the organs are found on such occasions, on the other hand, nothing is more liable to fallacy and inaccuracy, than the conclusions which we may be inclined to deduce from such observations. It is, too, often very difficult to determine the exact limits which distinguish what may have been the natural state of an organ, in the individual whose body we examine, from the condition to which it has been reduced by disease. The appearances we ascribe to the disease of which he died, may depend upon original defects or peculiarities of organization; or they may have been occasioned by preceding disorders; or the alterations of structure that we discover upon the inspection of dead bodies may be frequently the immediate consequence of death itself. It requires much attention and penetration, and, above all, it requires opportunities of

comparing a great number of observations of a similar description, to enable us to appreciate, with accuracy, the importance of any one in particular, and to determine, with precision, both the circumstances in which they resemble, and those in which they differ. This branch of medical science, even after the beautiful collections of observations that have been formed by Bonnet, Morgagni, Lieutaud, and Portal, still affords ample scope for the zeal and exertions of anatomists and practitioners; and can be perfected only by their unwearied assiduity.

Another part of anatomy, not less interesting perhaps, and almost entirely new, would be that which embraces the consideration of the changes that supervene, either at the different periods of life in the state of health, or in the different stages of diseases, whether acute or chronic;—changes, which death, certain accidents, or alterations in the mode of life, may cause to disappear. It would form a sort of living anatomy well worthy of the attention of philosophic physicians; who ought not to be discouraged from the undertaking by the difficulties attendant upon this branch of research. The beautiful and sublime truths which they would discover, would amply repay them for their trouble.

SECTION II.

On Physiology.

SEVERAL branches of physiological science have made great progress in modern times. There is undoubtedly a wide difference between the treatise *De usu partium* of Galen, and the writings of Stahl, Hoffmann, Boerhaave, Hamberger; of Whytt, Haller, Cullen; of Bordeu, Fouquet, Grimaud, Dumas, and Richerand. The mechanism of the different organs is, in general, well known; their functions have been satisfactorily determined; and that chaos of occult causes, with which the explanations of the ancients were obscured, has given place to rational scepticism, or to ingenious theories, which, if they still labour under difficulties, at least resemble the other branches of our knowledge in their language, which is daily becoming more precise. A number of valuable facts have been collected, relating to the general sensibility of the system, to the modifications which it experiences in the different organs, and the connections which it serves to establish between them. We have made some progress in elucidating the processes of digestion, sanguification, and generation.

generation. If the cause of muscular motion, and the immediate means by which it is performed, still remain enveloped in darkness, we, however, know, that this motion is strengthened or weakened, accelerated or retarded, revived or extinguished, according to certain laws. These laws have been discovered and established by a course of attentive observations: the power of producing these different effects has been found to reside in certain agents; and the force of the moving powers, and of the agents capable of modifying their action, has been subjected to calculation. Almost all the phenomena of vision admit of mathematical demonstration: and the eye is now regarded as little more than a dioptric instrument. The uniform relation subsisting between the state of the solids and the condition of the fluids, has been proved by the most delicate experiments, as well as from the most familiar observations. From some incontestable facts have been derived many beautiful views relative to the function of respiration and the production of animal heat: others, it must be confessed, seem to contradict, or at least to limit, the too general or hasty conclusions, that have been drawn from the former: but a considerable collection of curious observations and experiments has been made; and the different lights in which they have been successively viewed, hold forth the prospect of our being able to obtain more certain results at

no great distance of time. To conclude: the nature and composition of the constituent principles of animal substances have formed the subject of some very ingenious researches; and there is reason to hope that these researches will, in time, serve to illustrate several phenomena of the living system, and, particularly, those that occur more or less immediately after death.

It must, however, be acknowledged, that the characteristic signs of health and disease; that the general laws of the phenomena of life; that those remarkable relations established between the different organs of the body, which suggest so many useful practical views; in a word, that the affections and habits of the living system had been very well observed and described by the ancients. In fact, every one who is in the least conversant with their writings, cannot fail to perceive the solidity of the theoretical principles and practical rules, which these attentive contemplators of nature had deduced from their observations: and, perhaps, since the time of Hippocrates, the hypothetical systems that have been successively adopted in the science of the animal economy, have, in general, tended more to retard the future and permanent improvement of medical science, than to promote the ephemeral fame of their authors.

The explanations of the ancients, though formed upon the simple observation of the human frame in a state of health and disease, without the assistance of anatomy, or of the physiological views it suggests, without the assistance of experiments, the art of performing which was almost entirely unknown, or of the various collateral sciences, which are constantly furnishing us with direct illustrations, or with new instruments of research;—these explanations have not always been succeeded by others of a more just and philosophical nature. Several of their theories, indeed, have occasionally been revived with success, and seem destined to outlive those which, at first, had supplanted them: some appear to be impressed so strongly with the characters of truth, that every new improvement in the science only serves to confirm them: others, again, which the good sense of the founders of medical science led them to leave in a vague and indeterminate state, ought, perhaps, after the many fruitless attempts that have been made to give them a greater degree of precision, to be regarded as likely to retain for ever their original form. For the most strictly defined terms in modern medicine are only so much the more erroneous, that they establish, as certain, relations which have not been determined by an attentive examination of the subject. All this should

should be candidly and unequivocally acknowledged in a good system of physiology.

Perhaps, too, it would not be altogether useless to inquire the reason, why, notwithstanding the great advances of the present age, the ancients still maintain a decided superiority with respect to the arts and sciences of pure observation. If we divest ourselves of all prejudice, we may be led to believe, that it is owing to the confidence with which our superior attainments inspire us, to the facility of procuring books upon all manner of subjects, and to the practice of drawing almost all our knowledge from this last-mentioned source; that we must attribute this deficiency in depth, originality, and justness of conception, which is but too manifest in the works of modern observers. A great part of their time being spent in reading, they seldom view with their own eyes what the real observer sees in nature: for the truths which it costs so much trouble to extort from the latter, are easily found in books; and the advantages in other respects so important, which result from the quick diffusion of knowledge, are attended with this inconvenience, that the improvement of the mind, with regard to the extent of its acquirements, is often counterbalanced by the loss it sustains in respect of the force and permanence of its conceptions; that the memory of words is often enlarged

larged at the expense of the memory of facts; and that we often neglect objects which may be seen and examined, in order to inquire what others have imagined and said.

To give a systematic view of the different functions of the body, is the principal object of physiology. To accomplish this end, it is sufficient to present the principles or views relating to the science in a proper order, and always in the form of conclusions from the sum of the facts observed. The selection of the functions or phenomena with which we should commence, is perhaps, in a great measure, arbitrary; although in that, as in every thing else, there is, no doubt, an order which may be called *natural*, because it is the one best adapted to the association of our ideas. Various artificial methods have been employed with advantage: and almost all of them seem equally well calculated for the purpose. In fact, in the animal economy, every thing is related and connected together in such a manner, that there is no one phenomenon, which we can regard as the first, or as the last in order. The circulation of the blood depends upon the action of the nervous system. The action of the nervous system, on the other hand, depends upon the circulation. The due performance of respiration, again, is equally necessary for both; but,
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without the concurrence of both, respiration could not go on.

If we endeavour to class the objects of physiological inquiry, according to the differences and division of parts, we are still where we were: for throughout the whole system, we meet with organs of all orders and descriptions, which enter as component parts into the various members of the body. The muscles, for instance, contain arteries, veins, nerves; the coats of the arteries exhibit in their structure nerves and veins, and probably also muscular fibres*; and so on.—It is, to use an expression of Hippocrates, a circle, of which we can discover neither the beginning nor end: and, as in drawing a circle, it is of little importance at what point in the circumference we commence; so, perhaps, it may be allowable to inquirers in physiology to follow the arrangement which gives them the best idea of the objects of research, and which impresses them most firmly and distinctly on the memory. It is, however, sufficiently easy to employ in this branch of study, as well as in all the other departments of research, the natural method of observation, or that in which we begin with the objects first observed,

* The analogy of the arteries of the larger animals, in which they may be easily seen, justifies us in the presumption, that these fibres also exist in the arteries of the human body, but are too delicate to be perceived.

with

with the most obvious phenomena, in order to proceed by degrees from the known to the unknown, till we reach the most remote or subtile objects of research, which are, of course, those which nature presents last to our view and examination.

SECTION III.

On the Relations of Medicine and Moral Philosophy.

IT is now beginning to be perceived, that medicine and moral philosophy form but two branches of the same science, which, when united, constitute the *Science of Man*. Both rest upon a common basis,—upon the physical knowledge of the human constitution; and it is to physiology, that they must look for the solution of all their problems, and for the confirmation of all their speculative and practical truths. Upon the physical sensibility of the system, or of the organization that determines and modifies it, depend, in reality, our ideas, our sentiments and passions, our virtues and our vices. The disordered or regular emotions of the mind have the same origin as the diseases or health of the body: and
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this source of the moral affections is in the organization of the human frame ; upon which both the power and manner of thinking essentially depend. On it are imprinted in indelible characters, and by the hands of Nature herself, those immutable principles which form the only solid foundation of our rights and our duties. Equality, liberty, virtue, and happiness, closely united together, are identified in some measure with our existence : oppression, tyranny, vice, and misfortune, equally inseparably allied, as it were in a destructive and invincible system, proceed always from direct and evident injuries done to our original nature, and from the subversion of the relations that are established between man and his fellow-creatures, by their common organization.

From the proper use of our faculties ; from a respect for that voice within our breast, whose suggestions are always sufficiently distinct, if we are inclined to hear them ; from a scrupulous and attentive observation of that spontaneous direction, which our innate desires and propensities assume ; in short, from the habitual study of ourselves and others, of our own sensations and their objects ;—proceed liberal sentiments, just and magnanimous ideas, reason, virtue, happiness. From a contempt for that divine voice within our breast ; from the abuse of the gifts of nature ; from a blind forgetfulness of

the eternal laws by which the universe and we ourselves are governed, spring all our errors, vices, and sufferings. It is important, and even highly necessary, to point out this constant connection between the different states of our physical frame, and the different states of our moral constitution. It is by shewing, in what manner our sensations are quickened or blunted; in what manner our ideas are elevated and enlarged, or degraded and contracted; in what manner the passions are produced and developed, at one time acquiring a degree of energy which overcomes all obstacles, at another time remaining wholly inert, or, after a few ineffectual struggles, becoming deadened and extinguished for ever: it is only by possessing ourselves of all these invisible regulators of the human mind, that we can hope to be able to direct it by sure paths to happiness. It is by these means, that we are enabled not only to accustom the mind to a proper way of thinking, and to render morality a sort of want, but also to enlarge all the faculties of man, to increase and refine all his enjoyments, and to gratify with real objects of contemplation that restless propensity which is incessantly carrying him beyond himself,—that insatiable desire of novelty which cannot be restrained within the bounds of space and time. Thus it happens, that, during his short and confined existence, the idea and conviction.

conviction of a progressive and unlimited improvement in his condition extends his mental acquirements, in some measure, to infinity.

The necessity of searching, in the physical constitution of man, for the means of directing and improving the human mind, is proved from the consideration of the circumstances that connect, with the developement of certain organs, the formation, and often sudden formation, of certain propensities, and of the particular ideas that relate to these propensities; and from the attentive study of the moral effects produced by certain habits of regimen, by certain diseases, by certain original peculiarities of organization, or by certain accidental states of the living system.

Take, for example, the infant whom the fickleness of his tastes hurries incessantly from one object to another. Do not his half-formed manners, his lively but unconnected ideas, present a faithful copy, if we may so express ourselves, of the style in which nature has sketched the outlines of his life;—of his quick but imperfect digestion; of his frequent, unequal, and irregular pulse? Are not the characteristic features of the infancy of our physical frame all exemplified in the infancy of our moral constitution? And can we suppose that the latter will be affected by agents, that do not exert an immediate influence upon the functions of the different organs and general movements of the system?

Observe that youth, who haunted by a vague uneasiness, continually absorbed in revery, and melted to tears by the slightest emotions, begins to find ideas in his imagination, and desires in his heart, which, before, were unknown. At the same time that the flame of passion is kindling in his breast, that his mind lays eager hold of every thing around it, and pursues every novel object, his stature, his features, manners, looks, and found of voice, acquire a different character. His deportment becomes more firm and impetuous; his physiognomy, though still very delicate, assumes a more animated cast; his cheeks often change colour; his eyes express both desires, and the ignorance and uncertainty of their aim. —It is then only that nature makes him sensible to the language of passion, which speaks to his heart, and the knowledge and use of which he accordingly very soon acquires. Do not his ideas, his moral and his physical dispositions, all evidently agree? and are not the changes that have made him, in a manner, a new being, solely dependent upon the developement of a system of organs, which, till then, had remained inert, and which, for the most part, had scarcely attracted his attention*?

Perhaps

* I say, for the most part, because I speak of mankind in general. In a former work of mine, intitled, "*Rapports du Physique*"

Perhaps, this period produces still more important and remarkable changes in females. In them, the relations of the moral and physical constitutions are distinguished by features apparently more delicate and superficial, but in reality more characteristic and profound. A young girl, whose organs begin to be roused from the dormant state in which they had remained during early age, does not move a step, does not speak a word, does not cast a look that retains the character of infancy: the change is so evident, as to strike the most inattentive observer. The timidity, embarrassment, and caprice in her behaviour, which she in vain strives to conceal; her vague and uncertain looks, that give place to an expression which seems to dread discovery, and to a fire which breaks forth with more violence, the more that she labours to disguise and conceal it; all these circumstances united can leave no doubt in the mind, with regard to the revolution in the system that has just been affected, with regard to that important operation of Nature, which announces and produces changes of still more essential importance to the final accomplishment of her plan. That bosom, the undulations of which so often describe the affections of the heart, and

Physique et du Moral de l'Homme," all these ideas are illustrated in greater detail: See in particular the *Memoir On the influence of the Sexes on the formation of Ideas.*

which, at first sight, seems designed only for an object of soft desires, becomes now fitted, according to the admirable provision of nature, for preparing the food of a new being, whom these same desires are destined to call into life. Thus, a whole system of organs, the source of the most lively passions, and the influence of which not only modifies the other functions of the body, but also gives birth to so many new ideas and moral sentiments before unknown, is, in the hands of Nature, nothing more than the means by which she ensures the indefinite duration of the human race.

Observe, too, in mature age, in what manner the regularity of the pulse, the permanent energy of the functions, and the inveteracy of the diseases of the system, correspond with a greater uniformity in the disposition, with the more steady ideas, and less lively, but more profound and indelible passions of manhood.

On the other hand, take the frigid body of the old man, and mark if that regular but slow circulation, those blunt, and in a manner infantile sensations; those diseases, for the most part of a phlegmatic character, and of which nature seems hardly to dare to undertake the resolution, do not afford the faithful image of that tardy flow of ideas, of those puerile and irresolute desires,

fires, and of that repugnance to form designs which the individual cannot hope to accomplish, which all characterize the decline of life. In short, the physical constitution of the old man affords both the indication and the picture of a mind, which, contracting by degrees within itself, prepares for bidding a final adieu to existence by the most lamentable of all sacrifices, by disengaging itself from its social affections.

In the different asylums which have been instituted for the reception of lunatics, in those, too, which the legislature appropriates to the confinement of criminals, whose errors are but a species of insanity, you may find numerous proofs, perhaps still more striking, of those constant relations between the physical and moral constitution of man. From their inspection you may learn, that criminal habits, and aberrations of reason, are always accompanied by certain organical peculiarities, manifested in the external form of the body, in the features, or in the physiognomy. And you must remark, with the satisfaction which benevolent minds always feel at such a discovery, that these two species of disorders are frequently blended, and are always more or less intimately connected together.—I confine myself purposely to these most striking examples, the subjects of

which are constantly before our eyes, and may be therefore so easily examined*.

The physiologist, then, will in future be obliged to collect with care all the facts relative to these points, which the study of man in a state of health and disease can supply, and their results will form the basis of all the moral sciences. Henceforth no one can, with propriety, undertake to illustrate these subjects, who is not possessed of an exact and circumstantial knowledge of the connection between good or bad physical habits, and good or bad intellectual and moral dispositions. It is by these means alone, that we shall be able to learn how to improve the one by the other: it is upon these principles, that we must found the rules of their improvement; whether we address ourselves merely to individuals, in order to teach them the art of augmenting their happiness; or point out, to whole communities, the means of turning to the best account all the advantages of their lot. It is, in fine, according to such views, that we shall be enabled to trace, with certainty, the plan of a gradually increasing state of prosperity, of which men of reflection and philanthropy have hitherto, perhaps, only shewn the possibility, without forming to

* This subject has been treated at full length in the work above quoted, which is particularly devoted to its consideration.

themselves

themselves a perfect idea of the means that ought to conduct mankind to it.

The method of rational empiricism, which collects facts in order to class them, by pointing out the laws which govern their relations to each other, admits of a complete application to physiology. A number of observations have been already made:—These must be connected in a natural order. Others remain to be made:—and these we may sometimes indicate by anticipation. In particular, it is of importance to determine carefully, in what design, and by what methods, all inquiries of this sort ought to be made, so as to prove successful; and in what manner the conclusions ought to be deduced, so as to prove certain; by what characteristics we may be able immediately to recognise the accuracy of these conclusions; and in what manner it is expedient to connect them with those which already form the basis, or elementary principles of the science, in order that they may serve mutually to correct and illustrate each other.

SECTION IV.

On Pathology, Semiotics, and Therapeutics.

PATHOLOGY, or the doctrine of morbid affections; **SEMIOTICS**, or the doctrine of symptoms; **THERAPEUTICS**, or the art of deducing from the two first the proper methods of treatment, form, when combined, the practical part of medicine.

The great variety of the subjects, perhaps also the idea, that, by continually dividing and distinguishing them, we should be able to simplify and illustrate them, and facilitate their study, often induced the scholastic philosophers to separate that which should have remained connected, while other equally inconsiderate motives led them still more frequently to confound objects which had no connection whatever. It is evident, that the descriptive and historical exposition of a disease, the catalogue of the symptoms which characterize it, and the method of applying to it the curative means, are absolutely inseparable, or, to speak more accurately, this method can be founded on nothing but the above-mentioned catalogue and circumstantial exposition.

However, the custom alluded to has prevailed in almost all systematic works: the division I have described, is still pretty strictly observed: and no

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one thinks of inquiring, whether it exist in nature, or whether any advantages result from its use.

Towards the middle of the last century, Sauvage, by classing diseases in the same way that botanists arrange plants, introduced into practical medicine a fourth branch of instruction, to which he applied the name of *Nosology*. Sagar, Linnæus, Vogel, and Cullen, have since produced other systems of Nosology, designed upon somewhat different plans. In each of these systems, diseases are arranged according to certain features of resemblance, which the author supposes them to possess. Neither the art, in itself, nor its method of instruction, have perhaps gained much by such classifications; but tables, so confined as to the space they occupy, and so extensive as to the matter they embrace, and in which the principal objects of the science may be viewed at a single glance, easily persuade the reader, that he is acquainted with these objects, because he knows their titles or definitions. Hence, they are always favourably received.

The idea, however, of the classification of diseases was first suggested by Sydenham. The opinion of Boerhaave with regard to them, encouraged Sauvage very much in the execution of his labour: and the successors or imitators of the latter have fancied they improved upon his method,

thod, by reducing it to a dry nomenclature, in which the reader looks in vain for the learned disquisitions of the professor of Montpellier.

Sydenham was desirous to possess such tables of diseases, as under each particular head would have recalled to his mind his own observations and the observations of others; and which would have placed before his eyes, the history of diseases and their corresponding mode of treatment. Nothing, at first view, can appear better devised, or likely to prove more useful, than such a plan. But this eminent genius did not advert to the circumstance, that, in following the method he proposed, a physician would hardly be able to form good tables for any but himself, for, by transposition, the indications become always disfigured. A practitioner delivers views of disease that are perfectly correct only to those who have received the same impressions as himself: consequently, the misapplication that may be made of these views, by readers, whom long practice in the observation of nature has not rendered familiar with all the phenomena of the morbid state, and who have not arrived at the pitch of being able to recognise, as the ancients expressed it, *ex ungue leonem*; this misapplication of the justest ideas may become the source of the most pernicious errors.

The scholastic system of pathology has been gradually improved in the hands of a few teachers, whose talents enabled them to introduce a certain method, even into the most complicated classifications. Among the works which have been published on this subject, and dictated by this systematic spirit, one of the most esteemed is that of Gaubius, the pupil of Boerhaave, and celebrated for many useful and learned performances. But the true pathological method is displayed to greatest advantage in the writings of the ancients, to which a few useful additions have been made by a small number of modern observers. Hippocrates, Aretæus, Alexander of Tralles, Aëtius, Paulus Ægineta, Galen, and two or three Arabian physicians, have left us the most exact descriptions of disease, of which the art can boast; this no one possessed of any candour can deny. We may further add, that their general rules of treatment, deduced, at least in general, from the minute investigation of nature, are calculated to excite our astonishment, no less by the sublimity of the views which they indicate, than by their admirable propriety and truth.

The pathology of the ancients is always identified with their semiotics. Sometimes, they separate their histories of disease from the account of the methods of cure: but in common their plans of treatment, supported, as they are, by both,

both, serve to reflect an additional degree of light upon them, which the mere view of the spontaneous operations of nature is often incapable of affording.

The labours of the ancients have been epitomised in several modern works. The brief description of diseases by Lommius presents a compendium of what Sennertus and Riviere abridge, it is true, but nevertheless present more in detail. Duret, Houlier, Baillou, Jacot, Prosper Martian, Piquer, and some others, have explained and confirmed their remarks, by many observations of their own. These monuments erected to the glory of antiquity prove, even at the present time, abundantly stored with solid information. Their perusal will be found very useful; in particular, that of the short collection of Observations by Lommius is one of the most instructive books which a young physician can read. By joining with it the Treatise *De præfagienda Vita et Morte* of Prosper Alpinus, and some of the books of the *Methodus Medendi* of Galen, he may not only become familiar with the pathology and semiotics of the ancients, but may also acquire a competent knowledge of all the doctrines which their practice has sanctioned*.

Abridge-

* In this place, I deem it unnecessary to mention several modern authors and professors, who have attempted to introduce

Abridgements and systems, while they present us with the result of numerous observations, do not always supersede the necessity of referring to the original sources of information. The observations of the ancients, condensed, as they are in general, with most genius in their own writings, are easily connected with the summary doctrines which they have deduced from them; and the memory receives and retains them with the greater facility, as they are the offspring of genuine rational empiricism. Rarely do those of the moderns possess the same happy characters. This, perhaps, may be ascribed to the circumstance of the most important subjects having been anticipated and described by the former in so striking a manner. Perhaps, too, that remarkable talent for observation which is so conspicuous in Hippocrates, in Aretæus, and some others, has been less quickened among us by physical and political circumstances: and perhaps, the inhabitants of the northern and western parts of Europe have really less natural penetration than those of Greece, of Asia Minor, and of the islands of the Hellespont.

duce a reform into pathology: but I cannot pass over in silence the merits of our worthy Pinel, whose *Nosographie* is not only one of the most happy efforts of classification, but forms, in almost all its parts, an exact and complete compendium of practical medicine.

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Whatever be the reason, our best observations are still in a very scattered state; and the systematic works which give a summary abstract of them, by no means supersede the necessity of recurring to the original observers. In order to collect these different descriptions of disease, it is necessary to peruse many volumes; and, thus, erudition, which strengthens, perhaps, a few vigorous minds, but which, for the most part, clogs and hebetates common intellects, becomes necessary to the physician.

It is sufficiently evident, that one of the principal objects which those capable of contributing to the reform of the science should constantly have in view, is to endeavour to adapt it, as far as possible, to the intellectual capacity of all;—to free it, both from its false jargon, and from its scientific pomp. It is high time to institute a revival and selection of truths: it is high time, also, to form a selection of books. All those which are not really original, or directly instructive by their method of arrangement, should be carefully perused: all the useful matter which they contain, should be extracted, and afterwards they should be laid aside, perhaps for ever. When the inventory of our knowledge shall have been once well formed, its history rapidly sketched, and the road that conducts to great discoveries traced with exactness, men of
good

good sense, without fatiguing themselves by fruitless and tiresome study, should devote to the investigation of nature a great portion of that time which at present they employ in consulting books: and having their minds formed by the perusal of the small number which are really capable of strengthening, enlarging, and directing their judgment, they cannot be too eager to encounter, if we may so express ourselves, the actual objects of their labours.

In the study of practice, in which the phenomena, or the points of view in which they are to be regarded, are so numerous and various, the adoption of this plan is still more indispensably necessary, and will probably be found still more highly useful. The requisite course of reading for the young practitioner may be reduced within the compass of a few original books, and a few collections of select and well-arranged observations. These books should be read in some measure at the bedside of the patient; and the new facts presented by nature may serve for a commentary upon them. The office of the teacher may be confined to the task of indicating and determining, with accuracy, the objects which should be attended to and examined; of demonstrating them to the pupil under a proper point of view; and of teaching him a good method of observation and inquiry.

The physicians of Cos, who did not adopt so many useless divisions, who did not believe that the perfection of their art consisted in such vain and subtle classifications, were far from imagining that the history of diseases, the doctrine of symptoms, and the science of indications, could be separately treated and distinguished. Still less did they suspect that practical medicine, of which they form, as it were the indivisible members, could ever be taught from a professorial chair, at a distance from the objects of its application.

The system of medical instruction is composed of subjects differing in themselves, but differing also in the manner in which they should be taught. Some are communicated very well in the form of written lectures, or in the learned conversations of a skilful professor. Books, although, in general, to be preferred for this species of instruction, yield, however, in certain respects, to descriptions which the sound of the voice, and frequently the sight of the hearers, renders more animated; and to explanations, which being more detailed, without becoming fatiguing by their prolixity, are better adapted to the different capacities of the pupils; and, besides, in oral instruction, we have it in our power to present repeatedly, and under new forms, those points which do not appear to have been at first properly comprehended. But the subjects which admit of this method, are few
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in number; and in all others, the professor can be well understood only in presence of the objects themselves. To attempt to describe a muscle, a disease, or a chemical operation to a person who has never seen this operation, disease, or muscle, is like attempting to convey the idea of the flavour of a particular fruit to one who is unacquainted with it, or of the odour of a perfume to one who has never inhaled it.

The Greeks, we find then, taught the practice of physic, at the bedside of the patient: and for this reason they applied to it the term *clinical*. Nature supplied the text of the lectures, and the doctrines delivered were confirmed or corrected by facts.

At Rome, where the art of medicine was generally practised by Greeks, the same method was constantly employed. The physicians in greatest repute carried their pupils along with them to visit their patients; and, in this way, accustomed them to observe nature in its different aspects; to follow it in all the changes which it undergoes; to foresee the results of its spontaneous efforts; and to calculate the effects of remedies. Their patients, indeed, were thus exposed to the additional inconvenience of being too often uncovered and handled by the pupils of their physician.

Under the emperors of the East, hospitals were erected and maintained, not only for the relief of the diseased poor, but also for the improvement of the art, and the instruction of students. The same plan was followed by the Arabians, whose colleges in the East and in Spain had always a hospital in their neighbourhood. The Arabian physicians looked upon a large infirmary as a necessary laboratory for the observations and experiments of the practitioner; as a sort of gallery, in which the young student would find a display of instructive pictures, which books must always imperfectly describe. In short, they no more imagined that, in their schools, they could dispense with an assemblage of patients, than with a collection of remedies, or a chemical and pharmaceutical laboratory, or a garden for rearing medicinal plants.

Several of the seminaries of Europe, especially since the revival of the Hippocratic system of physic, have enjoyed the same advantages. But it is only lately, that true clinical schools have been introduced into our universities, and have been formed on a plan worthy of the information and philosophy of the age. Not that physicians have not been always aware of the necessity of observing diseases, in order to become acquainted with them; of following the different plans of cure, in order to compare and appreciate

ciate them, to repeat or correct them: but it was solely in consequence of the zeal of a few enlightened professors, that instructions in the true practice of physic were sometimes given in hospitals; for the lectures, which they presumed to call by this name, were commonly delivered within the halls of universities. There nothing could confirm the assertions of the teacher, when they were founded, and nothing could confute them when they were contradicted by observation and experience: words were heard, but nature remained unseen.

The schools of Vienna and Edinburgh first supplied this void. The philosophy and zeal of Joseph the Second* rendered the school of Vienna for a long time superior to any thing of the kind, which, till then, had been conceived. That of Edinburgh, rendered famous, almost on a sudden, by a reunion of men of distinguished talents, has not only acquired the greatest celebrity, but has really formed many excellent practitioners, several of whom continue to render, in different parts of Europe, the most essential services to mankind.

In a small work upon Hospitals, published

* Notwithstanding the active part which this Emperor took in the coalition against France, we may still venture to praise him for the good which he has done, and to praise him, in particular, for that spirit of toleration, which he was anxious to introduce into his dominions.

about the commencement of the Revolution, I proposed the establishment of clinical schools in France, pointing out their advantages, and demonstrating their necessity. I was seconded in this wish by all those who had the improvement of medicine at heart. In the same essay I gave an account of the attempts which had been made by my respected master, Dubrueil, under the auspices of the Marshal de Castries, at that time Minister of the Marine; and shewed, that to these attempts we owed the institution of the two Clinical Schools of Brest and Toulon: and the services which these have rendered furnished me with sufficient proofs of the justness of the views that had directed their establishment.

In 1792, the Commission appointed to inspect the hospitals of Paris, of which I had the honour to be a member, was desirous to put in execution certain projects which were supported by the suffrages of the most enlightened men, and which were dictated by a desire to promote the public good. We had made choice of the hospital called *La Charité*, for the establishment of the first clinical school: the plans were prepared, and the means were all calculated and provided. But, in a short time, the whole of France fell into the power of the too celebrated *Commune* of Paris. The Commissioners of Hospitals, believing their services to be no longer useful, gave in their resignation, or were dispersed; and the

the little good which they had been able to effect, was in a great measure annulled: in particular, the execution of the scheme, which they had projected, was suspended till a happier moment.

At length, the first law for the organization of the Schools of Medicine enacted, that, in future, the pupils should receive clinical instructions in these schools: and all the means that are calculated to render such instructions productive of benefit, have been combined with great judgment and care in all the three seminaries, but particularly in that of Paris. All that they now want, is to be allowed to proceed quietly in their labours.

By particular regulations, indeed, all hospitals might be easily converted into so many small schools of practice. Nothing could be more advantageous: for the young student would then find, in every quarter, that genuine practical instruction, which is the most necessary of all. When they came to be introduced into the large schools, they would carry along with them the habit of observation which they had acquired: and the other branches of medical science would arrange themselves with the greater clearness and distinctness in their minds, as they would have collected the materials of it, with senses that were improved by this same habit of observation, and with a judgment that was accustomed to order the

itself upon impressions immediately derived from the objects of research.

It is surely superfluous to enlarge upon the advantages of clinical schools in general : and it must be sufficiently obvious how much the multiplication of these establishments in hospitals for the sick may become beneficial. In the first place, the patients in these hospitals will be more carefully treated : for, when they are the subject of useful observations, they must also become the object of particular attentions. The physician, being more directly interested in the success of the plans of treatment pursued, digests them with more attention, applies them with more care, and takes more precautions for making the influence of the regimen concur with the operation of the medicines. Under his eyes, and almost without his assistance, young pupils are formed, whose instruction is the more solid, as it is given at the expense, if we may say so, of nature herself, and as it is, to a certain degree, independent of the talents of the professor. By this continual exercise of their penetration and judgment, from the view of scenes composed entirely of facts, the pupils contract the habit of observing them better, and feel an aversion to all reasoning that is not conformable to them : they acquire, in some measure involuntarily, that true
philo-

philosophical spirit, which in medical research is founded upon this habit and taste. Complete collections of the observations which have been made upon all the infirmities of the human frame, are soon formed in the journals of cases kept by the professors; and from their comparison are derived the most certain rules for the modifications which the treatment of these same diseases may require, according to differences in the climate, the season of the year, the state of the atmosphere, the age of the patients, their constitution, &c. General epidemics, or those common to different countries, and partial epidemics, or those peculiar to certain situations, are observed with greater care in their variation and returns, and are described more faithfully in their most transient phenomena. To conclude: by numerous trials, we ascertain the power and utility of all the known remedies; and we venture to make such experiments as are pointed out by analogy; a quick communication and interchange of ideas is established between the different observers, who are bound by one common interest not to conceal the fruits of their researches: and from all these materials, there must necessarily result more comprehensive, regular, and exact systems of science, which will daily approach nearer and nearer to the truth, and which, from their susceptibility of being applied and accommodated

modated to all manner of circumstances, will unite the advantages of prudent dogmatism, with all the benefits of genuine rational empiricism.

SECTION V.

On Hygiene.

HYGIENE teaches the means of preserving health, and forms an important branch of moral as well as of medical science. Ethics, being in fact but the *science of life*, how is it possible for this science to be complete, without a knowledge of the changes which the subject to which it is applied may experience, and without a knowledge of the means by which these changes are effected? Hygiene, therefore, and, consequently, some concise notions of anatomy and physiology, should form a part of every system of education. In order to derive the greatest benefit from our intellectual faculties, in order to direct our inclinations and desires in the way most favourable to our happiness, it is absolutely necessary to adapt all our physical habits to the nature of our employments, and to the moral dispositions that we are desirous to cultivate: for a good regimen is
often

often sufficient to harmonize our ideas, and to regulate our passions. Both, it is obvious, are derived from a similar source, from the impressions received by the different organs of the system; and volition, when it is exerted, puts into action these same organs, which nature has subjected to its control. How desirable then is it not, to be acquainted with the structure and immediate functions of these useful instruments, by means of which we receive ideas, form desires, and execute all our labours! How disgraceful is it not, to remain ignorant of the causes which may promote or derange their action! How many ridiculous prejudices, how many vain alarms, what puerile credulity does not this ignorance generate, even in minds sufficiently enlightened in other respects!

The dietetic books of Hippocrates, the most ancient we possess on the subject, are still to be ranked among the first, on account of the valuable matter which they contain. Several learned physicians have commented upon them at different periods. Lorri, in his *Traité des Alimens*, has almost invariably adopted the general views delivered in them, and has confirmed them by all the facts which the natural philosophy and chemistry of his time were capable of supplying.

Marsilius Ficinus, obliged, as he was, by a delicate state of health, to be particularly careful in his

his regimen, collected numerous observations on this subject, and laid down a variety of rules for himself, which he, no doubt, believed to be safe and useful : but as his head was filled with astrological notions, and hypochondriacal fancies, we can place but little confidence in his judgment, or even in the accuracy of his recitals.

Cardano, endowed with a penetrating genius, but discovering little judgment or attachment to truth in his observations ; Bruyerin, who, to a thorough acquaintance with the works of the Greek physicians, joined a true spirit of observation ; Sebifius, who is placed by Boerhaave at the head of all the writers on Hygiene, leave little to be wished for in regard to general rules. But Sanctorius has since opened a new channel of investigation ; Cornaro, and the author of the English work, intitled, “ An Account of the long Lives observed in the Three Kingdoms,” lay down certain popular precepts for the preservation of health. Lommius, and more lately Mackenzie, have treated the same subject scientifically. Cheyne has not investigated it thoroughly ; but his book presents some refined views : and Arbuthnot, from whom we might have expected a truly philosophical work, has, in his *Essay On the Nature of Aliments*, considered this subject only in a very partial manner.

To conclude; I might point out a few other books, both on gymnastics *, and on the regimen of persons in disease, or on the daily use of different sorts of food. Some of these contain useful or curious matter; but none embraces the science of dietetics in its full extent. Bacon alone, from some views thrown out apparently at random, seems to have contributed more than all the rest towards its future advancement †.

But leaving this imperfect catalogue of books and authors, we may remark, that at different periods of life, as well as in different diseases, the same sorts of food do not produce the same effects. Every stage of life has its peculiar habits and passions. Both, when directed according to the obvious intentions of nature, and confined within the limits which she assigns to them, conspire equally to the support of the physical and moral health, and to the general developement of the system.

In different climates, and in different situations, the temperature and condition of the atmosphere,

* The work of Mercurialis is still deserving of perusal.

† I purposely avoid making mention of the treatises, whether general or particular, which have been published on this subject by living authors. We have long been in expectation of a work from the pen of Professor Hallé, which will, no doubt, prove worthy of the author and of the learning of the age.

the quality of the waters, the exhalations from the soil, the nature of the food which it supplies, of the employments which it necessitates, and of the tastes or the wants which it engenders, operate, sometimes in concert, at other times separately, in forming certain distinguishing local habits. The diversity of these habits strikes even the most inattentive observer, who naturally refers them to their true cause,—the difference of soil and climate. He perceives, that they are useful or necessary in one place, and dangerous, or even fatal, in another: and every thing proves to him, that, in their turn, they become the immediate cause of the external appearance, and even, in a great measure, of the character peculiar to the inhabitants of different countries.

Certain it is, that man, though apparently the weakest of animals, is, in reality, the strongest. He habituates himself, by degrees, to all temperatures, to all modes of living: he accustoms himself to the greatest fatigues, and to excesses of every description: he can harden himself, so as to bear the most sudden changes without inconvenience. His firm and pliant fibres adapt themselves to every state in which he is placed: and, frequently, in those circumstances which appear calculated to overwhelm and destroy his vigour, he finds the means of developing new faculties, that excite even his own astonishment.

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The use of certain kinds of food or drink may tend to confirm or impair certain moral habits. Sometimes, it may operate directly, and by the immediate impressions which it produces; at other times, by the different states of health or disease which it occasions, or by the changes in the fluids and solids which result from it: for all these different alterations in the system soon manifest themselves more or less distinctly in the ordinary dispositions of the will and understanding.

The passions, the peculiar cast of the ideas, the nature of the intellectual exertions, the habit of certain trains of thought, or their introduction into a mind which they tend to agitate, may, in their turn, exert the greatest influence on the physical frame. Every day, we meet with the most striking examples of this power which the moral habits possess over the physical constitution,—a power which appears incomprehensible, only when we look for the source of these intimate relations, beyond the organs by which we receive impressions, and which are capable of acting and reacting upon each other. How many men are killed or cured, by the force of the imagination! How many constitutions are impaired and debilitated, or re-established and, in some measure, renewed, by particular affections, by the flow of ideas and sentiments assuming an unusual direction! Bacon asserts, that to form
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some new scheme every day, is one way of prolonging life; that, it is true, wisdom inclines man to uniform and tranquil pursuits; but that fools, in all probability, on account of the contrary disposition, would have a greater chance of long life, if their extravagancies did not hurry them into a number of immediate dangers.

This much, however, is certain, that the abandonment of the occupations to which we have been long accustomed, deranges the order of the vital actions, accelerates old age, and shortens life; and, frequently, very obstinate chronic distempers have been cured, by snatching the patient from the languor of repose, or the monotony of retirement, and by imposing new duties upon him, or changing the nature of his employments.

All the facts illustrative of these general views should be carefully collected, compared, and discussed. We may draw from them, even at present, some useful rules of Hygiene, which will be found equally applicable to every system of education, whether public or private: and this almost new branch of moral and physical science presents to the inquirer a rich and ample field of research.

We should not, indeed, confine ourselves to the description of the different sorts of food, to an account of their nature, and to the determination

of their effects: but we ought to point out the trains of impressions, ideas, or desires, which may result from their use; and we ought to estimate each particular mode of living, with reference to its influence upon the ordinary dispositions of the system, and upon those of each organ, its faculties, and its functions. It would be doing little, to determine the utility of exercise, or the effect of any particular kind of exercise: we must take into review the various employments to which man may be subjected in different parts of the globe, and in different circumstances of life: we must examine in what respect they may become useful or injurious; what are the means of obviating the bad consequences attendant upon them, or of rendering their beneficial effects more complete, constant, and certain.

In considering the powerful influence of the passions and ideas upon the state of the organs, upon their developement and their functions, we ought to be no longer satisfied with the vague and general assertions to which physicians and moralists have hitherto confined themselves: but we should endeavour to apply our knowledge to direct practical purposes, and see whether, from the comparison of the observations which have been already made, with those which daily experience must naturally offer to inquisitive minds, we might not form a collection of rules for regulating the employment of

the mental affections, so as to promote the re-establishment or preservation of health. In short, by embracing the view both of our physical and moral constitution; by pointing out their relations, and the means by which they act upon each other, we may hope to be able to render these doctrines, when completely confirmed, subservient to the general improvement of the system. And we may here repeat, what I have elsewhere observed; that the uniform experience of ages proves, that physical peculiarities of disposition are transmitted from parents to their children; and some well ascertained facts, several strong analogies, and the general laws of the animal economy, lead us moreover to believe, that certain moral habits are also propagated by generation. In laying down the rules of regimen, therefore, we must carry our views still farther,—we must aim at the progressive improvement of the whole human race.

SECTION VI.

On Surgery and Surgical Operations.

THE art of surgery, rising, as it did, with medicine, was not separated from it till in the times of ignorance and barbarism;—those times in which the priests and monks were, and desired to continue, the only physicians of Europe. A pretended *dread of the Church at blood*, or rather, the profound state of degradation into which surgery had fallen, in the hands of a rude and worthless set of men, made these monks and priests deem it politic and expedient to abandon operative medicine to barbers and mountebanks.

In Hippocrates' time, this separation had not, and, indeed, could not well have taken place. It only appears, that the right of performing certain operations belonged exclusively to particular persons. Hippocrates, in his Oath, comes under the obligation not to practise lithotomy, either for the above mentioned reason, or because he regarded the wounds of the bladder as mortal. In France, this same operation was for a long time the patrimony of a single family, in which the right to its performance from father to son, was recognised, and in some measure sanctioned, by a tacit agreement and by popular prejudice.

Hippocrates was physician, surgeon, and pharmacist, and wrote on all the three branches of the science. His surgical works may vie with his other writings: and, even at this day, if we can derive no new information from them, we may at least perceive in them the first glimpse of the light which modern discoveries have thrown upon almost all the branches of the art. His Treatise "Concerning the Wounds of the Head" contains a number of valuable observations, and shows, that the author possessed a true surgical genius.

Celsus, in sketching and describing the state of medicine among the Greeks, gives also a view of their surgery. Paulus Ægineta enriched the art with several inventions and plans of treatment of his own. Under the Arabians, it also made some progress. But it was not until the revival of anatomy, about the time when Vesalius shook off the yoke of Galen and of the schools, that, with the aid of natural philosophy which opened for itself new channels of inquiry, it took that bold range which has since conducted it from one discovery, from one triumph to another. Ambrose Paré, Fabricius Hildanus, Fabricius of Acquapendente, Marcus Aurelius Severinus, John de Vigo, Guy de Chauliac, and several others, may be considered as the fathers of surgery among the moderns. The seventeenth century has given birth to several distinguished practitioners of the art; but the eighteenth

teenth century maintains a decided superiority, both with respect to the characters of the persons who have exercised the profession, and the importance of the truths which they have established, or the prejudices and errors which they have overthrown. Palfin, Dionis, Duverney, Solingen, La Peyronie, Rau, Heister, Petit, Lamotte, Quesnay, Monro, Louis, Pouteau, Chefelden, Pott, the two Hunters, and many others, whom it would be too tedious to enumerate; some of them embracing all the branches of the art, and treating it in a systematic manner; others, again, directing their attention to those particular points which their genius or particular circumstances led them to select, have simplified, improved, and enlarged it: while the eminent operators, whom we have lately lost, such as Desfault, Choppart, &c. or those who still survive, and whom I shall avoid mentioning, in order not to betray too great a partiality for my countrymen, by naming almost none but French surgeons; these eminent operators, I say, have been continually removing the boundaries of the art by their indefatigable exertions, and forming pupils every way worthy to succeed them.

Almost all the important parts of surgery have been successively reviewed, and have undergone many useful changes. The cure of fistulas, especially those of the anus, the amputations of the larger limbs, the diseases of the bones, the

operations for the stone, for hernia, for aneurism, and those of the obstetric art, &c. have all, in less than a century, made such considerable advances, that we may justly regard the art as in some measure completely renovated.

It is, I presume, unnecessary to remark, that the study of surgery, like that of physiology, is to be referred to the three methods of investigation above mentioned—the descriptive, historical, and deductive; while the study of hygiene employs chiefly the two latter. But, perhaps, it may not be improper to observe, that instructions in surgery, being always necessarily given in presence of the objects of its study, have afforded less scope than those in some other branches of the science, for the delusions of quackery, and the fictions of the imagination. The improvements which this department of medical education may still require, are so easy as to admit of being completed and confirmed for ever by the example of a single teacher sufficiently conversant with philosophical methods.

With regard to the improvements which should take place in the elements of the art, the obstacles that oppose their introduction proceed, partly from the imperfections of its scientific language, and partly from the too mechanical character of its general principles. We have seen how far, and in what manner it is possible to remedy the
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former of these disadvantages, and what new disorders may arise from a similar reform. The latter inconvenience proceeds from the very nature of surgical studies. Slow and narrow minds, who always form the most numerous class, find visible and palpable supports for their reasonings and theories, in the circumstance to which we have alluded. For the habit of reasoning upon objects which they have before their eyes, tends very much to inspire men with confidence: but, unfortunately, a rough sense of perception and confined knowledge are not always sufficient for enabling them to discover the character of objects through their external covering. This custom of regarding every thing as material, may lead them into numberless errors, and must often prove fallacious, when applied to practice. It is therefore to the improvement of physiology and pathology, that surgeons of talent and discernment should particularly direct their attention.

The instrumental and manual part improves, if we may say so, of itself. But the treatment of a wound which is rather serious; the influence of an important operation upon the system in general; certain extensive, though often not very perceptible changes, which general disorders and surgical complaints exert upon each other; all deserve to be particularly attended to. True skill is shewn as much in rendering an operation

unnecessary, as in performing it well; in curing a wound, or any other local affection, by internal and general means of cure, as by the application of topical remedies or by the most ingenious instruments. In short, surgery must borrow certain views from general medicine, in the same way that medicine is often obliged to have recourse to surgical assistance.

SECTION VII.

On Materia Medica.

THE description of the means which art employs for the cure of diseases, constitutes what is called *Materia Medica*. These means or remedies are the productions of nature. Chemistry and pharmacy combine them and prepare them: clinical medicine teaches their application, and notes their effects. Thus, the knowledge of animal, vegetable, or mineral substances, of the external characters by which they are distinguished, of the manner of their formation, of the country which produces them, and of the changes which time occasions in their properties, forms a branch of natural history. On the other hand, all the decompositions, combinations, and mixtures to which

which they are subjected, before being applied to use; all the modifications which they experience, or which they are capable of experiencing in these new combinations, or in their application to animated bodies; belong to the province of chemistry and pharmacy: while the observations made at the bedside of the patient, upon the virtues of the remedies, which, when arranged in the same order as the symptoms of the diseases in which they are exhibited, complete the history of the latter, ought properly to be referred to clinical medicine; for they can only be supplied by observant practitioners.

It is by examining, by touching, viewing, smelling, and tasting, the different articles of *materia medica*, that we learn to know them: it is by seeing them decomposed and compounded, and by observing the qualities of the products or new combinations, that we acquire just notions of their chemical properties: it is by witnessing their preparation in a laboratory, by preparing them ourselves, that we form a clear idea of their transmutations, and of the different properties, which the different modes of preparation may impart to them: and it is only in the course of long and extensive practice that we become acquainted with the real properties of medicines, and learn to appreciate them, not in a vague manner, but by their real effects, circumscribed and determined
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with accuracy, and with reference to the particular cases in which they have been observed.

Nothing, certainly, can be more difficult, than to ascertain, with regard to the medicines we employ, the real share which they may have in the changes that occur subsequently to their use. The observations and experiments upon this subject present many uncertainties and difficulties, and are liable to various sources of inaccuracy. It is often no easy matter to decide, whether these remedies have really had any share whatever in the production of the changes observed. There are so many accidental circumstances which may have given birth to the phenomena observed, or at least may have modified them in such a manner as to render it impossible to discover their true cause. And it is still more difficult to ascertain precisely the particular property, which renders any remedy capable of producing any particular effect.

If we turn over the books of materia medica, we shall be surprised to find the same substance ranked in several different classes and genera. At one time, it is purgative, at another, aperient, at another, expectorant, and so on. It is more particularly among the class of sedatives that we meet with remedies selected from almost all the other classes; and the most credulous can scarcely avoid entertaining some doubts of the propriety of such an arrangement. When applied to the
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living body, remedies act in very different ways, in different circumstances. Sometimes it happens, that a purgative proves sedative; at other times, a tonic, an acid, a bitter, &c. The same medicine may become, by turns, evacuant, diuretic, and sudorific. It is therefore necessary to determine the variations which arise from this diversity of effects, by a series of experiments, repeated by different observers, in different places, and in all the different circumstances in which the animal body can be placed. It is even sometimes necessary to inquire, if the remedy, which is the subject of examination, possess any real and determinate properties whatever.

Thus, then, the best system of materia medica would be that which gave a faithful extract of the observations collected at the bedside of the patient, upon the properties of medicines, either according to the classification of their general effects, or according to the arrangement of the different methods of cure. This is the plan which Vogel seems to have had in view; but unfortunately he contented himself with giving the result of the observations, without ever entering into a detail of the circumstances which alone could serve to characterize the effect observed. When he speaks of the properties of *cinchona*, for instance, he shews very well that this species of bark has been employed with advantage in such and

such diseases, quoting at the same time the authors who mention its use: but he gives no detailed account, or even general view of the symptoms of these disorders, the season of the year, the constitution of the patient, or the proper time for the administration of the remedy;—all circumstances capable of modifying its action very materially, and without the knowledge of which it is consequently impossible to estimate it duly. It is, therefore, sufficiently obvious, that these long collections of observations, often contradictory in themselves, can be of little use to the reader, if he possess no means of reconciling these contradictions, and of discovering in each particular case the true cause of the effect obtained. The work of Vogel, then, though excellent in some respects, must be recast, or at least revised: and experienced practitioners, who, in taking advantage of his laborious researches, would undertake to collect and to class the facts which he points out, confining themselves to a delineation of their principal characters, would unquestionably render a most essential service to young students. And this new undertaking would be still more instructive, if the authors added their own observations to the numerous facts related by Vogel, whether they tended to confirm the conclusions obtained from the latter, or to confute them and correct them.

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It is, besides, very evident, that the student, before he has begun to observe for himself, can learn absolutely nothing from general abstracts of the observations of others: and when one has formed for himself a catalogue of remedies, the effects of which he knows from personal experience, he will scarcely be inclined to look into books for the indications of their use. Our materia medica is already too extensive; and we are not so much in want of new remedies, as of a good method of employing those which we possess. Capiacci used to say to his pupils, *Discite meam methodum, et habebitis arcana mea*.

This method of treating the subject of materia medica, would be altogether clinical: it is only, I repeat, at the bedside of the patient, that the most important part of it can be taught with success.

SECTION VIII.

On Chemistry and Pharmacy.

As yet chemistry is but remotely allied to the practice of physic. The knowledge of the changes which the different sorts of food or medicines may experience in consequence of their admixture with the

the different substances which they meet with in the stomach, is no doubt useful and necessary to the practitioner: but these changes are far from being so various or important as some persons seem to imagine; and, besides, if they were so, it would be still very difficult to ascertain them with accuracy. Stahl used to observe, *Chemiæ usus in medicina nullus, aut fere nullus*:—an opinion which was unquestionably true with respect to his age, and which is, perhaps, equally applicable at the present time. The fresh lustre which the labours of the modern chemists, and, particularly, of the French chemists, have imparted to the science, and the highly meritorious endeavours of some of them to render the discoveries that are made in it directly subservient to the medical art, do not appear to have hitherto furnished us with any very comprehensive, or, what is of more consequence, with any very certain results. We ought not, however, to despair of one day deriving from it some light respecting the relations of animated bodies, in their different states, with the other bodies of nature; and it is easy to imagine, how much the science of hygiene and practical medicine would be benefited by such illustrations. But the experiments necessary for the attainment of this object are not to be made in laboratories: it is not by operating upon bodies devoid of life and sensibility, that we can expect to arrive at results.

results which shall be all equally sure and applicable to practical purposes. It is by the observation of the living and sensitive frame; it is at the bedside of the patient, and in large infirmaries, that we must practise this new, this animated chemistry, if we may so call it, of which all the products become disfigured the moment that death takes place. To be susceptible of application to dietetics and practical medicine, these results, and the theoretical consequences which flow from them, should be supplied by observations relating to these subjects; for they will be just, only in as far as they rest upon facts immediately deduced from them.

In the present state of our knowledge, chemistry is the guide of natural history: it points out the means by which the arts may appropriate to themselves its various treasures; it prepares, combines, and multiplies the substances which are capable of supplying our wants; it begins to shed its light upon the different branches of physics properly so called; and several phenomena, which had been till lately but imperfectly understood, have been referred to the class of combinations or decompositions of which chemistry has discovered the laws. To conclude: this science, from which almost all the arts derive assistance, is, as it were, connate with pharmacy; it forms, indeed, part
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of it; and it is from this science that medicine has derived a number of its most powerful remedies.

Chemistry, after having long remained the inheritance of quacks and enthusiasts, is now diligently cultivated by the best informed and most distinguished men of the age. After having so often served as an instrument of folly; after having corrupted, by its pernicious influence, various branches of natural science; it has at length assumed a truly philosophical character, and follows the most sure and unerring path of research — Such is the real cause of its rapid and splendid success.

Pharmaceutical chemistry has followed the same career, and is animated by the same spirit. Its processes have been becoming, every day, more simple and more rational. The trash with which our pharmacopeias and dispensaries abounded, is gradually disappearing; and although the reform be far from complete, yet, from the manner in which it has been begun, we may indulge the hope, that the follies and puerilities with which officinal preparations and prescriptions formerly teemed, cannot long resist the powerful influence of reason.

This reform is, in a great measure, the work of Baumé*; it is he, at least, who first exposed the

* When my respectable colleague, Deyeux, shall have published his Pharmacy, we may consider this reform as in a manner terminated.

gross absurdity of several preparations, the inefficacy of others, and the improper practices of druggists and pharmacists. Since his time many of these abuses have been corrected, as far, at least, as the nature of a trade, where probity has no guarantee but itself, would allow it to be: and the pharmacopeias have gradually reduced the number of their formulas, and banished the complicated processes of the ancients, the futility of which has been demonstrated by our recent acquirements.

It is not by the perusal of books, that we can hope to learn chemistry and pharmacy; but by witnessing the various processes of these arts, by performing them ourselves, and by rendering ourselves familiar with the subjects of them, and the instruments by which they are effected.—This method, we must again beg leave to observe, applicable as it is to all practical studies, is so excellent in itself, that the talents of the professor become in a manner superfluous, and nature herself, that is, the presence of the objects of research, corrects almost all the mistakes which he may commit in his oral instructions.

In quitting this subject, it is, I presume, unnecessary to remark, that the method of analysis and recombination is peculiarly applicable to chemistry. We know what great advantages this science has derived from a more strict application

of philosophical methods. By employing them upon material and sensible objects, it has improved the methods themselves, and the same analysis, which it so constantly practises, has, when handled in a skilful and considerate manner, no longer appeared inapplicable to intellectual subjects.

SECTION IX.

On Botany.

SEVERAL branches of science were ably and successfully cultivated by the ancients; while many others, on the contrary, remained in a state of infancy. The practical works of Hippocrates are admirable: but his writings on Anatomy and Materia Medica are below mediocrity. The "History of Animals" by Aristotle may be regarded as a model of composition, both for the manner of portraying the general characters and analogies of the animal kingdom, and for the extreme accuracy of its details:—never was nature delineated with a more steady hand. His "Natural Philosophy", again, is not only unworthy of the author; but we may safely pronounce it to be nothing more than a tissue of absurd and ridiculous opinions, the offspring of a subtle and misguided imagination; and

and with respect to the language which he there employs, it would, perhaps, be difficult to find any where else an example of such a caballistical jargon.

While certain branches of physical research have made great and rapid advances, others have languished in an obscurity, for which it is not always easy to account; and have remained in the back-ground, notwithstanding the accelerating impulse, which they seemed likely to receive from a belief of their necessity, or from the popular prejudices in their favour.

Such was the case with Botany, which before the time of Hippocrates can scarcely be said to have existed. This distinguished writer mentions a great number of plants; but he confines himself to a description of their medical properties.—Theophrastus and Dioscorides created the science: Pliny and Galen enriched it, but without reducing it to system: and the Arabians left it nearly in the same state, in which they had received it from the ancients.

Among the moderns, Matthioli, Falloppia, and Fabius Columna, revived the science; while John and Caspard Bauhin, Cæsalpinus, and Gessner, reformed it and improved it. It has been recast, and, in some measure, renovated, by Tournefort, who, after exposing the imperfections of the methods that prevailed in his time, had the courage to pro-

ject, and the perseverance to accomplish the plan of its entire reform. This plan, which was at once simple and comprehensive, could have been conceived only by a strong mind, and executed only by the most indefatigable exertions.

Ray, though living in retirement, with few books, and without the means of undertaking extensive journies, has, notwithstanding, made many useful researches, and suggested many useful views. He was the first who perceived the necessity which there is, if we wish to avoid confusion, for distinguishing plants not according to the resemblance of a single part, but according to that of all, or, at least, of the most important parts. Although in practice this system be liable to many difficulties; yet we must acknowledge, that it recommends itself by its accuracy, and that, in general, it accords very well with the external forms of plants, and even with their properties.

Among the systems which have since been proposed, that of Linnæus will always hold a distinguished rank. It still serves for the foundation, or, at least, the companion of the arrangements to which a more advanced state of knowledge, and a more sound method of philosophizing, have given birth.

This system is indebted, perhaps, for all its celebrity to the ingenious observation upon which it is founded: and, perhaps, its real advantages, whether

whether with reference to the mere botanical examination of plants, or to the acquirement of a knowledge of their uses, may be reduced within very narrow limits. The illustrious authors of the system adopted in the *Jardin National* seem to have formed the same opinion of its merits. They did not deem it incumbent upon them to confine themselves to a single characteristic in the classification of the different species of plants: their arrangement comprises and combines, in a manner, all of them; and by adding their own observations to those of their predecessors, they have necessarily produced a useful and highly finished performance.

Botanists seem, in general, to have taken the same pains to destroy the relations which their science has to other branches of knowledge, that they should have employed in searching for them, and in multiplying them. They sedulously avoid the consideration of vegetables in any other light than that of their bare description: their properties and uses are almost entirely overlooked by them: and some of them would even be indignant if the systems of arrangement discovered any traces of these important particulars. All attempts to introduce, into botany, views relating to medicine or the arts, would be regarded by them as tending to disfigure the science.

But this mode of insulating the study of botany, and of reducing it to the state of a dry nomenclature, may be considered as the principal cause of the aversion which many persons of excellent understanding feel for its study. To this circumstance, too, we must attribute the remarkable tendency, which it has to fatigue, often to no purpose, those memories which can retain ideas only by reasoning. And, if men of great judgment and discernment have long refused it the title and characters of a real science, we may reasonably impute the blame to this singular determination, on the part of its votaries, to allow hardly any useful application to be made of it to other branches of physical research.

I am aware, that when the object is to class twenty-five or thirty thousand plants, only a small number of which are known by their properties, it may be deemed superfluous to take into consideration this characteristic, which appears so essential in the eyes of the unenlightened class. But so much the worse, perhaps, for those who can learn and retain so many names and descriptive terms, to which no ideas are attached but those of some particular forms, or other external characters!

Botany, then, may be considered in two very different points of view; in the first place, as a simple classification of all the bodies belonging to the

the vegetable kingdom ; fecondly, as one of the great magazines of nature, from which medicine borrows feveral powerful remedies, and from which the arts derive many ufeul materials.

Viewed in the former light, botany would be a mere nomenclature, at leaft, if the fyftem on which we have juft been animadverting be perfevered in. Now, we may often have occafion to confult a fyftem of nomenclature : but the barren profpect it affords, can neither delight the imagination, nor intereft the underftanding.

In the fecond point of view, botany prefents an ample field for experimental research ; and aims at the difcovery of relations, which it is both ufeul to know and curious to determine. yftematic methods, which would faithfully delineate thefe relations, would ferve to gratify our natural thirft of knowledge, and the more laudable defire of applying the refults of our fcientific inquiries to the praftical bufinefs of life, and of rendering them fubfervient to our daily wants. This popular fyftem of botany would not be formed upon the narrow plan of Chomel, which is not fufficient even for the medical part to which he has confined himfelf ; but it would comprehend all the ufes of vegetables ; and their diftribution would be regulated according to the analogy of their properties.

Perhaps, in such a case, it might be advisable to have recourse to two methods of classification; the one comprehending the different species of nutritive, pharmaceutical, or poisonous plants; the other, those which are employed in the arts, or applied to certain purposes of inferior consequence, or relatively to which ignorance and error are less prejudicial. Might not this prove the means of giving a very general attraction to a science, the objects of which are capable of affording us such great and refined enjoyments? For nature seems to delight in clothing the plants in the richest and most beautiful colours, in impregnating them with the most delicious perfumes. We breathe, as it were, a new life with the invigorating air of gardens and of groves, as all of us must have very often experienced, and always with reiterated pleasure: but a dry scholastic method of contemplating the vegetable kingdom, must weaken these agreeable impressions, and leave few traces of them in the memory. The illusions of the imagination, and the sentiments that are dearest to the heart, blended, as they often are, with the ideas of verdure and flowers, do not make the study of a catalogue less insipid and monotonous, than it naturally is, or prevent the pleasure of contemplating objects that are both curious and interesting, from being entirely lost amid the labour of learning names, in general very unmeaning

unmeaning, or technical phrases, (which are but more circumstantial names) or arbitrary definitions.

But botany contains within itself many fruitful sources of discovery; and the most eminent men who cultivate it begin to be no longer satisfied with these barren arrangements. After remarking all the external characters, they have perceived that the phenomena which distinguish vegetable life, were far more deserving of research. In fact, the examination of the germination, growth, fructification, diseases, and death of the numerous tribes of plants, is not only highly curious as a branch of natural philosophy; but may also become productive of direct utility, by promoting the improvement of gardening and agriculture; and by furnishing the means of augmenting national wealth.

The physiology of plants should be founded upon their anatomy; and should itself serve as the basis of their pathology and therapeutics. The minute structure of their organs, and of the elementary parts of which they are composed, must, therefore, be studied with particular attention.

Thus, a new and noble path of inquiry presents itself to botanists of talent and observation. By combining the study of the phenomena which vegetable life offers directly to view, with the investigation of the different changes, combinations,

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or decompositions, to which plants are instrumental, or which they themselves may experience, we shall be able, perhaps, one day to detect the mystery of their formation and growth.

Medical botany may, no doubt, be learned in gardens, in the fields, and on the mountains; but it ought also to be studied in the laboratory and in the drying-shade. It is necessary to observe the changes which the same plant undergoes, not only during its desiccation, but also during its various preparations. It may be useful to compare the taste and smell, which it has when in the ground, with the taste and smell which it acquires, when withering, drying, and decaying, or which it imparts to other substances that are combined with it. To conclude; the knowledge of this species of botany is confirmed and completed at the bedside of the patient: and it is obvious, that it then encroaches upon materia medica, of which, indeed, it forms a part, and from which it cannot be separated, without ceasing to belong to the art.

SECTION X.

On Veterinary Medicine.

VETERINARY Medicine has been, in a manner, created in modern times. However, in Aristotle, Xenophon, and Pliny, and in the *Rei Rusticæ Scriptores*, we meet with a considerable number of observations collected by the ancients upon the art of preserving the health of horses, oxen, and dogs, and of curing the diseases to which they are liable. The rearing of horses has, in all ages, been an object of particular care and attention; the training of dogs and birds of prey forms the subject of a learned art; and as all these animals are liable to disease, men must have soon found themselves obliged to study the means of curing their complaints. But between these first rude attempts, and a true system of veterinary medicine, the difference is very great: and, although Ramazzini and some others had described, with accuracy, certain epizootic diseases; although they had endeavoured to ascertain what relations they might have to the epidemic disorders to which the human body is liable, and to determine the methods which should direct their cure; and although we were in possession of several very extensive treatises on veterinary medicine; the art could
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not, properly speaking, be said to exist, as it formed no regular body of science, founded upon a systematic collection of facts.

It may be said to date its origin from Bourgelat. It was, in fact, that celebrated veterinary surgeon, who first referred the empirical operations of the art to general principles, and combined them with more accurate notions of anatomy and physiology; and who not only connected the different observations on the subject in a methodical manner; but also indicated the views with which new observations should be made. To him we are, in particular, indebted for the first institution in which the veterinary art has been the subject of true clinical instruction, and in which lectures have been given, like those of practical medicine, in presence of the diseases which form the subject of inquiry.

The disciples of his school and the illustrious professors of that of Charenton, have proved the importance of this first successful impulse which the rising art had received: for in both these establishments it has made rapid advances, and both have produced several men of distinguished merit, whom we are so fortunate as still to possess*; and

* Since the above was written, a premature death has deprived us of Gilbert, not less to be regretted on account of the noble virtues of his heart, than for the talents and information which had procured him so great a degree of celebrity, at so early a period of life.

the students who repaired from all the countries of Europe to France, began, even under the old government, to apprize the nation of a treasure which they seemed to undervalue.

The increase, preservation, and improvement of the breed of animals are objects of too direct importance for it to be necessary to prove, how much the public welfare is concerned in the progress of the art relating to them.

Besides, it may surely be regarded as a duty incumbent upon us to bestow upon those beings who are endowed with sensibility like ourselves, and who so patiently share in our labours, all the care and attention, which can tend to increase the comforts of their existence. Do they not frequently form a part of our families, and are they not the most useful instruments of a number of enterprises, which serve to augment our riches, and to multiply the enjoyments of the social state? If our wants constrain us to deprive them of life before the period allotted to them by nature, can we neglect to render the small number of days which we leave them, and which we may still employ to our advantage, as agreeable as slavery will permit them to be? Or would it be to presume too much upon the benevolence of man, to expect to find, in the attentions which he bestows upon his useful companions, some sentiments of gratitude, joined to those of personal interest? I trust not. True benevolence,

nevolence, which is never extinct, and which operates often in silence, is undoubtedly less uncommon, than gloomy imaginations describe it, or depraved hearts affect to believe it to be. The evils of life are always striking from their nature:—but the good is obscure. Many persons treat their domestic animals as friends or companions: and the inhabitants of the country, when they lose them, mourn for them as for brothers. Such attachments are so nearly akin to those which unite man and man, that they surely cannot be too sedulously cultivated.

Those persons who to a proper degree of sensibility, without which man as a moral agent can scarcely be said to exist, join the habit of reflection, which alone can preserve the former in due regulation, violate none of these indirect affections of the heart; convinced, as they are, that such affections tend to improve their reason as well as sensibility, in the happiest manner, and that nothing is better calculated to impart a favourable direction to both. How easy would it be to revive in minds that are not entirely depraved, these sentiments of humanity, which prove such fruitful sources of the most refined enjoyments! Our happiness even requires, that they should be carefully instilled and diligently cultivated in our hearts; and that every thing which tends to weaken their force, should be removed from our sight.

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How, then, can we regard with indifference those instances of barbarity, which stupid brutality daily presents to our view? How can we ever become the accomplices of the capricious cruelty with which animals are so often treated? But with respect to our companions and the partners of our toils, it is not sufficient to avoid all unnecessary bad treatment: we must be more just, and endeavour to render them happy. They augment our enjoyments, and often preserve our life: let them therefore not pass theirs in suffering and privation. This consideration ought certainly to be added to the other motives which we have for improving the art of rearing them and preserving them in health.

It is sufficient for our purpose to have indicated the relations which this art bears to general medicine. I shall therefore abstain from the repetition of what I have said on this subject, as it must be obvious, that all the branches of the medical art are mutually connected, and illustrative of each other.

CHAPTER V.

On the accessory Branches of Study.

SECTION I.

On Natural History.

AMONG the different subjects that compose the course of medical studies, I have not enumerated natural history; because those parts of the science that relate to medicine are included, either in physiology, which itself comprises the history of the physical laws of animated bodies, and the description of their instincts and habits; or in chemistry, which may justly be regarded as the general instrument of analysis for all the productions of nature; or in botany, particularly that popular system of botany above mentioned, which is so intimately allied to vegetable chemistry, and which without having, perhaps, as yet thrown much light upon the phenomena of life, has certainly made us better acquainted with the substances which enter into the organization of the living system.

Systems of natural history, which are limited to the classification of the different productions

tions of nature, according to their external analogies, are unquestionably of great use in the arrangement of collections: an acquaintance with the general plan upon which the classification of each author is formed, may even exercise the ingenuity, or stimulate the curiosity of the young student: it may assist the memory, wearied as it must be by so many efforts, with which the reasoning powers have for the most part little to do: and, perhaps, may also sometimes suggest useful views to the observer. But such classifications, however methodical we may suppose them to be, can, in general, be no more called the science, than a catalogue can be called a library, or a list of names an assembly of men. Reduced to this state, natural history would certainly be altogether foreign to medicine, which has already but too many systems of its own.

SECTION II.

On Mechanical Philosophy.

MECHANICAL philosophy has discovered the laws, by which the motion of the celestial bodies is governed: it has measured the different diameters

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of the orbits which the stars describe: and proved that these laws, to which all their movements are subjected, serve, at the same time, to regulate the course of the seasons, and to produce all that variety of scenes and events which they present to our view. Mechanical philosophy, too, has ascertained the laws peculiar to that fluid, which is diffused in greater or less quantity over all the parts of the globe, and which by turns rolling upon its surface, or penetrating into the deepest abyſſes, or floating in the form of vapours in the atmosphere, seems to be designed by nature for the renovation of all the bodies of the universe, and for assisting their regular reproduction or continual transformation. The same science, too, has been able to measure and weigh the atmosphere, to estimate its powers, to decompose the rays of light, and to subject to calculation that universal and constant agent of nature,—motion. It has considered it with regard to the mechanical effects which it produces; with regard to the chemical changes which different substances undergo, in consequence of its more or less forcible application; and with regard to the direct perceptions which animated beings derive from it.

We may readily perceive the relations which several of these subjects bear to the different branches of medicine. The laws of equilibrium, of density, of expansion, and of the collision of bodies,

dies, may serve to illustrate several important questions of medicine and surgery. Not that we need go the length of asserting, with a celebrated author, that, when we are called to visit a person who has been wounded by a fall, we cannot, without a knowledge of the laws of gravitation, determine with precision the extent of the injury, even though possessed of the most accurate information with respect to the height from which the patient had fallen. This mode of proving the utility of a knowledge of mechanics in the practice of medicine may appear a little ludicrous; but there cannot be a doubt, that the bodies by which we are surrounded, or which we employ for the common purposes of life, produce upon us very different impressions, in different circumstances: it is therefore of great consequence both for the cure of diseases, and the preservation of health, to be acquainted with the laws of all the changes which these bodies may experience.

When Hippocrates recommends the study of astronomy in so particular a manner, and as so necessary to the young physician, it is not that astronomy which calculates, by learned theories, the course of the heavenly bodies, to which he alludes; but the science which determines the time and place of appearance, in the heavens, of certain stars, the different positions of which, with regard to the earth, regulate the succession of the

seasons; or in other words, the astronomy of observation: and, in order more fully to explain his meaning, he adds, that it is for the purpose of becoming acquainted with the changes which the terrestrial bodies may experience in the different seasons and different states of the heavens. For, he observes, the Sun, the Moon, Arcturus, and the Pleiades, exert a very perceptible influence upon the atmosphere, upon the earth, and upon every thing which floats in the one, or dwells on the surface of the other: and in the practice of medicine, it is of great advantage to be able to refer the effects to the different phases of these stars upon which they seem directly to depend. Thus, the diseases which appear with Arcturus, differ from those which the Pleiades occasion: several follow the course of the moon; and almost all are aggravated or mitigated, in proportion as the sun recedes, or approaches to the earth.

Since the time of Hippocrates, the doctrine of the influence of the celestial bodies has undoubtedly been carried to an absurd extreme. Credulous physicians have grounded many ridiculous fictions upon it, and quacks have employed it as the means of imposing upon weak minds. But it is, nevertheless, certain, that various phenomena of life follow exactly the solar and lunar periods, although we are unable to conceive in what manner events so different and remote can be connected

ned together. Writers of the greatest veracity adduce a number of observations, which leave no room for doubt on this point; and the most limited practice is every day furnishing proofs of their justness*.

Every one knows the effects that light produces upon plants. Whether it combine with them in the processes which manifest their peculiar life, or perform the office of a necessary stimulant for the support of their functions; certain it is, that they decay and become anasarcaous, when deprived of it; and revive and resume their colour, when it is again restored.

A number of facts collected by Pascal, an Italian physician, whom Morgagni quotes with great commendation, seem to prove that, at certain hours of the day, as well as at certain lunar and solar epochs, deaths are more numerous than at other times: and the practitioners of all countries are agreed as to their frequent occurrence during the solstices and equinoxes. Some observers, even, pretend to have remarked, that certain hours of the day are most favourable to the birth of children, and the young of several species of animals†.

* See, among other works on this subject, Mead *De Imperio Solis et Lunæ*.

† It was observed by my father, that young birds came out of their nest generally towards morning. See his *Essay on the Principles of Grafting*.

Whatever may be our opinion of the accuracy of these facts, and of the consequences which observers have ventured to deduce from them, their mere enunciation must serve to place, in a clearer point of view, the advantages to be derived from a knowledge of mechanical philosophy in the practice of medicine; and it is certainly desirable, that it should form a part of the system of instruction, or, at least, that it should be regarded as one of the necessary preliminary studies. But a little attention suffices to convince us, that the points of view in which mechanical philosophy really tends to illustrate our practical labours, relate to objects which, as we have found to be the case with natural history, are treated of in physiology, in materia medica, or along with the general doctrines relative to the morbid state.

SECTION III.

On Mathematics.

WE have already had occasion to remark, with what little success all attempts to apply geometry and algebra to the most important branches of medical

medical science have hitherto been attended *. The phenomena of life depend upon so many unknown causes, and are liable to be affected by so many circumstances, which observation in vain endeavours to appreciate, that the relative problems, incapable as they are of being stated with all their data, cannot possibly be referred to calculation. And when the sect of mechanical and mathematical physicians endeavoured to subject the laws of animated nature to their technical methods, they exhibited to the learned world a spectacle that was truly astonishing, and deserving of all their attention. The terms of the language which they employed were exact; their methods of reasoning were sure; and yet all the results were erroneous. And, moreover, although the same language was used, and the method of applying it followed by all the calculators, yet each of them obtained a different result. In short, it was by the uniform and rigorous methods of true research, injudiciously applied, that the most absurd, erroneous, and contrary systems were established.

No one can deny the direct and extensive advantages which have accrued to the physical

* I am induced to return to the consideration of this subject, because it is of great importance, and because the instance of the mathematical sciences is the best calculated for showing with how much caution ideas derived from the other sciences should be introduced into medicine.

sciences in general, from the application of geometry and algebra. But we must not abuse either; we must not, in particular, employ them in the investigation of subjects where they are inadmissible. Whenever the objects of research, or the relations which they bear to each other, are incapable of rigorous estimation *, the use of these valuable instruments becomes dangerous; for when it is not directly beneficial, it is almost always injurious. Besides, it is only the inferior sort of mathematicians who can be anxious to display a species of learning not very familiar to the generality of medical readers. They alone can take pleasure in seizing upon a province, their right to which has been always at least very doubtful. Little advantage surely is to be expected from translating into an unknown tongue that which common language expresses so clearly, or from transforming into a scientific doctrine, above the capacity of a great majority of students, that which a simple enunciation is sufficient to render intelligible to every one. And in justice it must be said, that those who are most eminent for mathematical knowledge, are not very emulous of this sort of distinction.

However, as we have already observed, the different branches of physiology have not been found all equally unsusceptible of this application

* That is, of being computed by fixed numbers or magnitudes.

of geometry and algebra. If the cause of muscular motion, and the immediate agents by which the contraction of the minute fibres is produced, are still involved in obscurity; if, in particular, it is impossible to refer them to the laws which govern inanimate nature: on the other hand, the force of muscular action, or rather the calculation of the active powers employed in each movement, has been found susceptible of rigorous demonstration. The mode, in which the rays of light, in falling upon the convex surface of the cornea, are refracted by the various humours of the eye, so as to form an image upon the retina, may also be demonstrated mathematically. It is true, that the sensation itself of this image, or the particular circumstances which render us capable of being apprized of its presence, still remain enveloped in the same obscurity: but the eye, considered as the material organ of vision, is really reduced to the state of a simple dioptrical instrument. Only its operations are more perfect than those of all others; the various refractions of the rays being so completely corrected by its different humours, that the images are always depicted upon the retina, single, well defined and circumscribed, having nothing indistinct about them, and exhibiting none of those different refractions, or rings, which surround always, more or less, the images produced by artificial instruments.

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With respect to the function of hearing, much greater obscurity prevails. The demonstration of the structure of the ear, by several eminent anatomists, has not proved sufficient to shew us in what manner the different vibrations of the external air can produce such a variety of delicate impressions upon the pulpy expansion of the internal auditory nerve. But the vibrations of a sonorous body, their mutual relations, the laws of their propagation through different mediums, and the rules of the combinations required for producing concords, have been ascertained with all the precision of calculation: the agreeable impressions caused by music, have themselves been reduced to the form of geometrical problems. The exact sciences, therefore, are not proper objects of study for the young physician, on account of the physiological operations which they may explain: but the theory of those arts, of which we ought to have at least some general notions, in order that we may thoroughly understand the laws of sensation, borrows illustrations from these sciences, which it could no where else obtain.

But it is not, perhaps, in these particular points of view, that they are of most extensive use: it is not enough to consider geometry and algebra as universal instruments of research, applicable to the great majority of the objects of human curiosity, and to many of the common purposes of life:

life: we must also estimate their advantages by the particular turn which they give to the mind. In fact, the science of geometry, by improving the memory and reasoning powers, by increasing the force, and if we may say so, the tenacity of the imagination; by teaching, by habitual practice, the art of deducing one demonstration from another: and the algebraic art, by elucidating, as it does, the true ideology of numeration, and the mechanism of analysis; by accustoming the mind to the different forms which the problems must assume before they can be solved, and to the successive exclusion of those data which tend to embarrass the process, or which counterbalance each other; by fixing determinate limits, between which the truth must necessarily be found; by affording the means of approaching, by degrees, to the precise point where it is placed; by presenting, in particular, continual examples of generalization, which the nature of the subjects must always render as just, as they are grand and striking:—by all these direct and indisputable effects, geometry and algebra may certainly become a most useful appendage to logic. By such vigorous exertions as those we have been describing, the mind acquires greater strength and activity; and it may also attain more quickness, perspicacity, flexibility, and comprehensiveness,—all qualities which it may transfer

fer with the greatest advantage to its other studies and labours.

I by no means, however, wish to insinuate, that geometry and algebra are capable of correcting minds of a perverse and untoward disposition, or that a calculator, because he reasons always well, when he resolves questions, the terms of which may be represented by quantities or numbers, will reason with the same accuracy or certainty, when he applies himself to subjects, of which the data are more various, uncertain, or mutable. Many instances have shewn, that the contrary often happens; and the mania of applying calculation to subjects where it is inadmissible, tends to place those mathematicians, whose judgment is defective, in a still more disadvantageous light than other bad reasoners. But the abuse of a good instrument should not prevent us from acknowledging its real utility.

SECTION IV.

On Philosophical Methods.

IF there be a science, of which the theories and system of instruction require all the perfection which philosophical methods can impart,—it is doubtless medicine. The difficulties of its researches, the extent of its materials, and the fugitive and versatile character of the objects of its attention, demand at once great caution and sagacity; a flexible imagination, which can follow all the variations of the phenomena, and a steady judgment, which never goes beyond facts; the faculty of receiving every impression in a lively manner, without allowing the mind to be governed by any one in particular. Among these various qualities, which some persons may regard as contradictory, those which depend on the manner of feeling are exclusively the gift of Nature; and all which assiduous culture can effect, is to improve them, and to facilitate their employment: but, on the other hand, it is by culture alone, that the reasoning powers are developed; for the art of reason demands a long and difficult course of tuition.

We may now with confidence refer the improvement of the processes of experimental inquiry to the amelioration of philosophical methods: and it
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is evidently to both that we are indebted for all the beautiful discoveries, with which chemistry and natural philosophy have in recent times been enriched. Certain it is, that from the moment when the views of Locke were introduced into the sciences, the sciences changed their whole appearance. Those, in which the method of analysis was, as it were, a matter of necessity, either from the nature of their subject, or from that of their design, had alone made sure and regular progress. All the rest will now enjoy the same advantage: and it is impossible to calculate or conceive to what pitch of improvement the human mind may, with their assistance, attain: for the real power of man resides much more in the instruments he employs, than in his natural faculties. His genius is more particularly displayed in their invention and skilful application: and it is this circumstance which forms the chief distinction between one individual, and between one nation and another. The methods of the human mind are, if we may use the comparison, its levers and its balloons: by their assistance it may move with facility the most enormous masses, or elevate itself to the pure fountains of light. Let us therefore endeavour to improve these valuable instruments, to the utmost of our power; impressed with the conviction, that, if in the most simple studies and enterprises they are of some use, they become absolutely indispensable

fable when the objects of these studies or enterprises are various and complicated: for in such cases they alone can guide our labours, and ensure our success.

But, after the remarks upon this subject, which have been already made in different parts of this work, it must be unnecessary to enter into farther details.

SECTION V.

On Moral Philosophy.

WE have above had occasion to shew, that all the intellectual sciences should be founded upon the physical knowledge of the human body: but we should have a very imperfect idea of the latter, if we neglected to study those organic functions which conspire to produce thought and volition, and to take into view that influence which both these operations exert on the whole, or on particular parts of the sensitive frame. Thus we see, that metaphysics and moral philosophy are equally necessary to the physician. On the former of these subjects we have already sufficiently expatiated. With respect to the second, as it is almost constantly connected with the details of practical medicine,

cine, it seems as if it were the sister, rather than the attendant of the latter. The errors of the imagination, or those of the passions and desires, are evidently the causes of a great proportion of the miseries of man. The diseases even, to which he is subjected, generally depend on his own errors, or on those of society, and are always liable to aggravation from the depraved state of his moral constitution. How much may erroneous opinions and irregular desires disturb the functions of the system! How many vicious habits may they not generate in the different organs of the body! And if it be true, that vice, like insanity, is often but a physical disease, how often, in their turn, are diseases produced, either by insanity, which, generally speaking, may occasion disorder in all the living actions of the system, or by vice, which, in reality, is merely a variety of the former!

The physician is doubtless unfit for his profession, who has not learned to read in the human heart, as well as to recognise the presence of the febrile state; or, who in treating a diseased body, cannot distinguish, in the features, in the looks, or in the speech, of his patient, the signs of a disordered mind, or of a wounded heart. How can he seize the true character of those complaints, which are concealed under the semblance of mental emotion, or of those moral disorders, which exhibit all the symptoms of certain physical diseases?

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How can he restore its wonted serenity to that agitated mind, to that soul consumed by a gnawing melancholy, if he is ignorant of the organic lesions, which these mental affections may produce, and of the derangement of the functions with which they are generally connected? How can he revive the dying flame of life, in a body drooping, or devoured by anguish, if he knows not what sufferings he must first alleviate, and what idle dreams he must first dispel?

Doubtless it is the duty of the physician to afford the sweetest and most soothing consolations to the patient couched on the bed of sickness; it is he alone, who can penetrate farthest into the confidence of infirmity and misfortune, and, therefore, it is he who can pour the most salutary balm into their wounds. But, for the same reason, he must not remain ignorant of the nature and destiny of these unhappy and too feeble mortals; he must not be void of compassion for those errors and miseries which may so readily become the lot of every one; but he must be indulgent and kind, as well as circumspect and reasonable. Every one else may hate vice, and be revolted at folly: but the physician, if he knows how to observe and judge properly; if he possesses good sense, if he is just and liberal in his sentiments, can feel only pity for both, and can only redouble his zeal for the service of those degraded and unfortunate
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creatures, who ought to excite his compassion more forcibly, the more that they are insensible to their own unhappy state.

Who has not had an opportunity of seeing some unfortunate beings, victims of their own fatal passions, drag on a languishing existence towards the tomb, while they sought for some expressions of concern, rather than for life? Who has not observed the cruel distractions of those terrified imaginations, who tormenting themselves with the tortures of their own fancy, combine sometimes, with this mania, sentiments of the sublimest virtue? Can there be a more grateful enjoyment, than to allay these groundless alarms, these fictitious terrors; to cause the voice of reason to be heard amid such numerous perplexities? Those persons who evince the greatest sensibility and compassion towards others (and such persons are most liable to all sorts of error) surely deserve the most particular attention on the part of the virtuous and feeling physician. Could any one, who is not completely ignorant of the sentiments which form the human heart, could any one avoid being deeply affected at the sufferings of those, who never witnessed the sufferings of others, without feeling an anxious wish to relieve them? Could he be sparing of his care and attention to those who live only by their social affections?

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But to return to considerations more strictly medical: we may observe, that methods of cure, which are often simple and uniform, when applied to individuals, whose minds or whose sensibility have received but little culture, become very complicated, various, and difficult, when directed to persons whose moral faculties have been completely developed. How many fibres may be agitated by the slightest causes, when the mind receives and combines a variety of impressions, and when many vivid emotions animate the breast! Not to speak of the habits which are contracted by application to different trades; whenever one emerges from the sphere of mere animal life, whenever one becomes separated from the common class of society, the treatment of each disorder demands particular combinations of ideas, and frequently combinations of ideas which do not relate to the disease itself. Thus, the practice of medicine is reduced to a few simple rules in the country, and in hospitals; but it is obliged to multiply, to vary, and to combine its resources, when applied to men of business, to men of letters, and to artists, and to all persons whose lives are not devoted to mere manual labour.

SECTION VI.

On the Arts and Belles-Lettres.

THE formation of ideas depending, in a great measure, as we have already observed, upon the employment of the signs which represent them; and the character of these artificial instruments being necessarily communicated to the ideas which they have so powerful a tendency to engender : it is evident how absurd the declamations of some professional pedants, against the literary studies of the young physician, are. Not, that a rhetorical style, or the ornaments of poetry, can ever be considered as proofs of good taste and judgment in scientific composition : on the contrary, they should be banished from it with the utmost rigour : but the sciences have also their own peculiar eloquence, which, far from disfiguring the truth, refines it, and augments its energy and force. A language that is precise, elegant, and, even at times, animated, discovers ideas, the first conceptions of which have originated from lively and distinct perceptions; the different particulars of which have been arranged with mature reflection; while a rigid judgment has circumscribed their connections in order to indicate, as it were by anticipation, all the conclusions that flow from them.

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Several writers, of considerable merit in other respects, owe the greater part of their errors to the barbarous style in which they have indulged : and, on the other hand, we may remark, that the most judicious inquirers are indebted for their happiest views, to the clearness, the precision, and the purity of language, which they have studied in their works. If, for example, Stahl had not adopted that scholastic and uncouth jargon which renders the perusal of his writings so irksome ; if he had not completely lost himself, as it were at pleasure, in that obscure style, that discordant mixture of Greek, Latin, and German, he might still, no doubt, have been at times inclined to conceal the original sources of his ideas ; but he surely never would have disfigured them in so ridiculous a manner, nor have sown the seeds of so many errors, in the mode of expressing himself. All the works of Hippocrates, that is, all those which are indisputably his, not only abound in striking and valuable, as well as enlarged and sublime ideas ; but the style of them is uniformly rapid, precise, easy, and pure. This style is certainly not that of Plato, of Demosthenes, of Xenophon, or of Lucian, but it may be said to equal them all in its way ; and we recognise, in particular, the greatness of the writer, in this very attention to preserve the manner and tone which agree best with his subjects. Although he always avoids

shewing himself to be the pupil of the most celebrated orators of his age, yet it is impossible not to discover from a perusal of his works, that all the beauties of language are familiar to him, and that his talent is the more perfect, as he knows so well how to conceal the art, in the rapid flow of his thoughts, and under that seeming inattention, which their copiousness, and the little time that remains for their arrangement, appear to create.

If truth often shew itself in the character of the style; if it become, as it were, more perfect, by what seems at first sight to be merely its dress; it is of much more importance with respect to its diffusion, that it be displayed in the form best calculated to attract our attention, and to stimulate our curiosity. The most just ideas seldom or never form part of public opinion, till after having passed through the hands of men of talent: and it is sufficiently apparent, that the prejudices which they sanction, are always the most difficult to eradicate.

We must not, however, forget, that the proper culture of the mind is acquired by a number of different impressions. Of this a single example may suffice. The science of man is undoubtedly applicable to all the practical purposes of life, and is even absolutely necessary to every one who lives in society. Now, it is obvious, that certain works, which are commonly regarded

as mere matters of amusement, present the only faithful pictures of human nature, which we possess; that the person who can read them and apply them to real life, acquires greater experience of the world, than the whole tribe of moralists can boast. And we may add that their perusal, while it refines the mind, rouses at the same time its activity; and that the agreeable images which it offers to view, serve not only to amuse it after drier studies, but enable it to resume the latter with increased delight.

The same remarks may be extended to the arts: not that one man can be supposed capable of attending maturely to so many objects at once; but because it is of importance to enlarge and improve the sensibility, by directing it successively to different sorts of impressions.—For the various perceptions we acquire, when they are lively, distinct, and accurate, necessarily leave, in the mind, many valuable materials from which the judgment sooner or later must derive advantage. Besides, the different languages of the passions should be familiar to those whose course of study embraces the whole science of man.

We see, then, under what relations, and to what extent, the culture of literature and the polite arts is connected with the severer studies of medicine.

SECTION VII.

On Ancient and Modern Languages.

DURING a long period of time, the study of languages formed, in a manner, the basis of the system of education pursued: a great part of infancy and youth was consumed in it: and this description of learning became an object of ambition, a path to preferment. As long as the Greek and Latin authors were our only preceptors, this was certainly so far proper; it was then no less necessary to be acquainted with the languages of both, in order to inform ourselves of their acquisitions in the different branches of learning, than it is at present to be an algebraist and geometrician, in order to become an astronomer, engineer, or navigator. But since the modern languages, at least those of civilized nations, have furnished excellent books upon almost every subject of inquiry, an acquaintance with the languages of antiquity has become less requisite; and they have consequently been less ardently cultivated.

Some philosophers have gone much greater lengths than the public; and have condemned the study of languages as causing a loss of valuable time, and as tending to enervate the powers of the understanding, by exercising only that species of
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memory which is most remotely allied with reasoning. They affirm, that good translations may supply us with all the useful matter which the books written in dead or foreign languages contain: and as to the particular beauties of style which they exhibit, the length of time required for enabling us to relish them, is, in their minds, too great a sacrifice to be compensated by enjoyments from which no solid advantages are derived.

Notwithstanding the authorities which may be adduced in favour of this opinion, I cannot, I must confess, by any means assent to it.

In the first place, the study of language, conducted in a philosophical manner, throws considerable light upon the operations of the human understanding; and the useful views which it suggests cannot be regarded as complete till they have been deduced from the comparison of several different idioms. It is necessary to be acquainted with the various order in which our ideas, or the elements of which they are composed, may be exhibited or reproduced, if we wish to avoid many errors relative to their natural order, and, perhaps, even to their formation;—errors which it is difficult to obviate, and impossible to correct, when we take into view only one combination of signs. Secondly, the impression made by the same ideas, expressed in different languages, is far from being the same. It will not be denied, that

that the art of speaking and writing well consists in the ability to excite, in others, the train of ideas and sentiments with which the writer is himself inspired, or, rather, to revive the perceptions which produced these ideas and sentiments, and to confirm them by the addition of others which may render their effects more powerful or distinct. Now, by this art, we may transfer certain striking ideas from the ancient languages to those which we at present employ, and in this manner improve, by successful translations, those necessary instruments of the human understanding. Nothing, certainly, can tend more to strengthen the mind, and to quicken its operations, or to furnish the memory with a greater store of conceptions, and varied turns and images of thought, than the perusal of the best writers in different languages: and the instruction to be reaped from them is always very imperfect, when we have not studied, in their original and inimitable form, the ideas of those men of transcendent genius, who deserve, on many accounts, to be ranked among the benefactors of the human race.

Many writers, in fine, who are well worthy of being read, and from whose works we may obtain much useful or even necessary knowledge, have not yet been generally translated into the languages of those countries which are furthest advanced in civilization and refinement. And we
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are often obliged to search for information in the languages of antiquity, or in those of cotemporary nations.

To confine ourselves, however, to medicine: it is universally acknowledged, that a number of excellent books, which treat of this science, are composed in Latin, and others in English, Italian, and German; and of these books, several are not translated at all, or are translated in so slovenly a manner, that the subject of them is, in a manner, burlesqued. The Greek writers, for example, have lost their peculiar tone and character in those Latin versions, which their modern disciples have left us; and in the greater part of the French translations they are perhaps still more disfigured. The Latins, although more nearly allied to us in situation, customs, and language, have, in general, equal cause to complain of the translators of their works; upon which point I may appeal to the few among the latter who deserve to be ranked as exceptions to this general censure, and who will readily admit, that they have never been able to equal their originals, and that the reader, who is acquainted with the great writers of antiquity only through the medium of translations, can form no true idea of their works.

The study of languages, therefore, should not be neglected in a course of general education, and should be particularly attended to in the education

tion of those young men, who are intended for the medical profession.

It is evident, however, that the different subjects of which we have treated in this last part of our work, cannot be considered as directly belonging to a course of medical studies; but some of them must be regarded as essential preliminaries, while others form very useful additions to it. Once more, let us remember, that in the sciences every thing is connected; that the more we know of them, the more new relations we shall discover between them; and although the infirmity of our faculties and the shortness of human life do not allow us to embrace the whole sphere of knowledge, yet the man of real genius ought not to remain a stranger to those acquirements, from which he may borrow, were it only in a very indirect manner, some information and assistance with regard to the ordinary and principal objects of his labours.

CONCLUSION.

SUCH have been the principal revolutions of medical science: such are the observations which its present condition appears to me calculated to suggest, whether we consider it in itself, or compare it with the other branches of our knowledge, in order to determine their reciprocal relations: such, in fine, are the views, which, in my opinion, should guide its reform, and direct its plan of instruction. Although these views and observations are not all equally important or original, yet I believe they will be found possessed of some utility: and although a performance of the nature of the present holds forth little prospect of renown, I regard it as a duty incumbent upon me to offer the result of my labours to the public. If it contained only a single useful idea, I should think myself fortunate in having presented it to those young students of the art, on whom the fairest hopes of its advancement depend.

The present period is one of those great epochs of history, towards which posterity will often look back, and of which it will expect a just account from those who had it in their power to accelerate and confirm the progress of the human mind, in the paths of amelioration. It is the lot of only
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a small number of fortunate individuals to exercise this extensive influence: but in the present advanced state of the arts and sciences, there is no one who may not, in some measure, contribute to their progress. The least real improvement in the most obscure art is quickly extended to all the rest, and the relations which have been established between the different objects of our labours, enable them all to benefit by the progress of each in particular. The ancients had, no doubt, a distant idea of these relations, and had perceived, that all the arts and sciences were connected together, and formed, as it were, a complete whole: but they had remarked this, without perceiving it distinctly, and had attempted to describe it, without knowing it thoroughly. It is only in recent times; it is only after having considered the various efforts of human industry in all their applications, and in all the different directions which they may assume; it is only after having subjected them to rules, and reduced them to common forms, that we have been enabled to determine with accuracy the mutual relations which connect them, and the influence which they exert, or are capable of exerting upon one another. We now know, and can demonstrate, that there is nothing insulated in the labours of man: they are united, if we may borrow the comparison, as nations are by their commercial ties:

ties: they mutually assist each other, like the members of the social community.

The most obscure individuals, therefore, have it now in their power to render themselves eminently useful: men of science and letters, to whatever branches of research they devote their attention, artists, and even the meanest mechanics, all in their particular spheres, may now promote the general good, and contribute to the progressive improvement of the human race.

And shall we, then, who, devoting ourselves to the alleviation of the sufferings of mankind, so frequently command the interests that are dearest to the heart; we, whom the high importance of these interests obliges us to search for information in all quarters, and whose studies embrace almost all the branches of physical and moral research;—shall we alone be exempted from the duty of promoting the general welfare of mankind by our labours, and of contributing to their amelioration? Undoubtedly not. Let us, therefore, unite our efforts, and endeavour to introduce into the study and practice of our art, that superior reason and philosophy, without which so far is it from affording useful aid, that it becomes a real public scourge: let us venture to connect it by new relations with the other branches of human knowledge; so that the latter, by its means, may be improved and illustrated. And at a time when the

French Nation is about to consolidate its existence as a republic, let medicine, restored to its native dignity, commence a new career, which may prove both rich in glory, and fruitful in benefits to mankind.

NOTES

BY THE

TRANSLATOR.

NOTES, &c.

NOTE [A], page 29.

UPON what authority M. Cabanis grounds this assertion, respecting Acron and Hippocrates, it appears not very easy to determine. All the writers, whom I have had an opportunity of consulting, agree in describing Acron of Agrigentum as having stayed the plague, not at *Agrigentum*, but at *Athens*, and that, not by blocking up particular passages in the mountains, but by causing piles of wood to be burnt near the infected persons,—in other words, by *fumigations*. He is thus mentioned by Plutarch, as having afforded relief to numbers during the Great Athenian Plague: "Ακρωνα γέν τὸν ἱατρὸν ἐν Ἀθήναις ὑπὸ τὸν μέγαν λοιμὸν εὐδοκιμῆσαι λέγουσι, πῦρ καλέοντα παρακάειν τοῖς νοσῶσιν· ὥντησε γὰρ ἐκ ὀλίγου. *De Isid. et Osir. Op.* Tom. VII. p. 506. (Ed. Reiske); and in a similar manner by Paulus Ægineta and Aëtius, in the following passages: " Porro si quispiam ingentem lignorum struem accenderit, egregie quidem udum aëra in calidum et siccum poterit convertere, quemadmodum et Acronem Agrigentinum fecisse perhibent." P. ÆGINETA *De Re Medica*, lib. II. c. 34 (Interpr. Torino). " Sed et rogo ingenti exstructo et intenso, aërem ad caliditatem ac siccitatem transmutare quis potest, humidum et frigidum factum; quemadmodum, Hippocratem Athenis fecisse dicunt. Itemque Acronem Agrigentinum." AETII *Tetrab. Sec.* S. I. C. XCIV. p. 246. (Ed. Basil. 1542.)

What seems to have led the author into the mistake, is the relation of Plutarch respecting Empedocles, the cotemporary and fellow citizen of Acron, who is described as having freed his country from pestilence by means similar to those mentioned in the text, that is, by closing certain apertures in a mountain, through which the *Sciroeco* blew upon the plain. 'Ο δὲ φυσικὸς Ἐμπεδοκλῆς ὅρως τινὰ διασφάγα, βαρύν καὶ νοσώδη κατὰ τῶν πεδίων τὸν νότον ἐμπνέουσιν, ἐμφράζας, λοιμὸν ἔδοξεν ἐκκλεῖσαι τῆς χώρας. *De Curiositate*. Op. Tom. VIII. p. 47. Vid. et lib. *Adversus Colotem*.

With respect to Hippocrates, we shall afterwards have occasion to shew, that there is reason to doubt his having been at Athens during the time of the Great Plague. At all events the authors who affirm the fact, and among others Aëtius, as we have seen from the passage above quoted, describe him as having employed the same preventive as Acron.

NOTE [B], page 62.

THE tradition, that Acron was the founder of the Empirical Sect of Physicians, rests chiefly upon the authority of Pliny, who, in describing the progress of medicine observes, "Alia factio, ab experimentis se cognominans Empiricen, coepit in Sicilia, Aerone Agrigentino, Empedoclis physici auctoritate, commendato." *Hist. Nat.* lib. 29. c. i. The best historians, however, are of opinion, that its establishment bears a much later date, and that *Philinus* of Cos, a disciple of Herophilus, who flourished about the CXXIII. Olympiad, was the real founder of the sect. The author of the "Introduction," inserted among Galen's works, insinuates, that *Philinus* was indebted to Herophilus for the

first hints of his system. Τῆς δὲ ἐμπειρικῆς προέστησεν Φιλίνος Κῶος, ὁ πρῶτος αὐτὴν ἀπὸ τῆς λογικῆς αἰρέσεως ἀποτεμνόμενος, τὰς ἀφορμὰς λαβὼν παρὰ Ἡεροφίλου, ὃν καὶ ἀκουστὴς ἐγένετο. *Ifagog.* GALEN. Op. (Ed. Charter.) Tom. II. p. 363.

His followers, however, desiring to give to their doctrines the sanction of antiquity, ascribed them to Aëron of Agrigentum. Θέλοντες δὲ ἀπαρχαίσειν ἑαυτῶν τὴν αἵρεσιν, ἵνα ᾗ πρεσβυτέρα τῆς λογικῆς, Ἀκρῶνα τὸν Ἀκραγαντῖνον φασὶ ἄρξασθαι αὐτήν. *Ibid.*—Of the latter it is related by Diogenes, that he composed several works on Medicine and Dietetics in the Doric dialect; but these no longer exist: and with respect to his opinions on medical subjects, we are wholly ignorant. Perhaps, as has been conjectured by Sprengel, he was distinguished chiefly by his rejection of theory, and by his contempt for the mystical dealings of his cotemporary Empedocles, and thence came to be regarded by the Empirics of succeeding ages, as the first who had introduced the peculiar tenets of their sect.

NOTE [C], page 73.

RESPECTING the origin of the Gymnastic System of medicine, we are informed by Plato, that Herodicus was led to conceive the first idea of it from the benefit which he experienced in his own case from the use of exercise. “The dietetic part of medicine,” he says, “had been neglected by the Asclepiades, and, indeed, could scarcely be said to exist before the time of Herodicus.—Herodicus, who was a teacher of youth, being of a sickly habit of body, combined Gymnastics with medicine, and harassed, first, himself, and, afterwards, many others, by the immoderate use of exercise.” Ὅτι τῇ παιδαγωγικῇ τῶν νοση-

μάτων, ταύτῃ τῇ νῦν ἰατρικῇ, πρότε Ἀσκληπιάδαι οὐκ ἐχρῶντο, πρὶν Ἡρόδικον γενέσθαι. Ἡρόδικος γὰρ, παιδοτρίβης ὢν, καὶ νοσώδης γενόμενος, μίξας γυμνασικὴν ἰατρικῇ, ἀπέκναισε πρῶτον μὲν καὶ μάλισα ἑαυτὸν, ἔπειτ' ἄλλους ὑπερον πολλούς. PLATO. *De Republica*. lib. III. Op. (Ed. Serran). Tom. II. p. 406.

The same author expatiates upon the dangers and inconveniences of this plan of treatment, and, in another passage of his works, shews to what an absurd extreme it was often carried by its inventor. To one of his patients, for example, Herodicus prescribed a pedestrian excursion from Athens to Megara, a distance of 180 stadia, or upwards of 20 English miles, but with the express injunction, that when he got to the walls of Megara, he should straightway return to Athens! PLATO. *Phædr.* Op. (Ed. Serran). Tom. III. p. 227.

NOTE [D], p. 83.

ALTHOUGH the Author, in his account of the life of Hippocrates, has by no means adopted all the narrations of his biographers, yet he appears to have admitted several which will not bear a strict examination. The history of the birth, education, and travels, of Hippocrates, is tolerably correct; but all the other particulars mentioned in the text are, at least, very questionable. As neither Hippocrates himself, nor the cotemporary writers, nor those who lived soon after his time, detail the actions of his life, little is known with certainty concerning him. To the narrative of Soranus no credit can be attached; nor are the traditions handed down to us by Ælian and Diogenes Laërtius entitled to greater belief.

Thus,

Thus, the cure of the young Perdiccas, on which so much stress is laid in the text, is generally supposed to be fictitious, and to have originated from the report of a similar cure, said to have been effected by Erasistratus. The account of the interview between Hippocrates and Democritus is not supported by any satisfactory evidence. The story, too, of Hippocrates having been invited to Persia by Artaxerxes, seems equally devoid of foundation: and, notwithstanding the authorities which have been adduced in proof of the assertion, it may be questioned, whether Hippocrates ever signalized himself by checking the progress of the plague at Athens. Galen, indeed, agrees so far with Soranus, in his account of the plague which Hippocrates is said to have stopped; but the silence of Thucydides on the subject affords a strong presumption, that this relation, also, is entirely fabulous. “ Il y a plus d'apparence,” says M. Le Clerc, “ que ce que disent Aëtius et Galien, ou l'auteur du livre *De la Theriaque*, est supposé, et qu'ils imputent à Hippocrate ce que Plutarque a dit, avec plus de vraisemblance, d' *Acron*, qui étoit quelque tems avant Hippocrate. S'il y a eu d'ailleurs une peste qui soit venue d' Illyrie, c'est ce que nous ne savons pas.” *Histoire de la Médecine*—p. 245, Amst. 1723.

A similar opinion is expressed by Dr. Ackermann, in the excellent account which he has given of Hippocrates' life and writings, in FABRICIUS' *Bibliotheca Græca*. “ Hinc, quam fidem mereantur,” he observes in conclusion, “ narrationes de honoribus Hippocrati Athenis habitis, de eo Eleusiniis Sacris ab Atheniensibus initiato, de alimentis ipsi posterisque suis in Prytaneo atis, quoque perspicitur; ipse enim Hippocrates, in libris quos ipse scripsit, nec morborum, quos in Attica observaverit, nec Athenarum
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“ adeo

“ adeo mentionem facit.” *Biblioth. Græc.* (Ed. Harles).
Tom. II. p. 512.

The same intelligent critic has, with great appearance of reason, conjectured, that these fables were all invented after the death of Hippocrates, and ascribed to him by the followers of the Dogmatic Sect, of which he was regarded as the founder. “ Hæc omnia post obitum Hippocratis de-
“ mum excogitata sunt a medicis, qui Rationalem Sectam,
“ cujus auctorem Hippocratem esse putabant, profiteban-
“ tur, quique eo majorem gloriam suæ sectæ conciliari
“ arbitrabantur, quo majore gloria Hippocratem floruisse,
“ dum viveret, aliis persuadere possent. Hanc ob causam
“ Epistolæ, quæ Hippocrati adscribuntur, in primis con-
“ scriptæ esse videntur, in quibus quoque de Democriti
“ famosa curatione ab Abderitis petita, nec non de Hip-
“ pocrate ad Artaxerxen, Persarum regem, per Hyftani-
“ dem Hellepontii Præfectum, vocato, sed Barbaris operam
“ pertinaciter negante, historiæ et complura alia hujus ge-
“ neris narrantur.” *Ibid.* p. 512—13.

NOTE [E], page 87.

OF the numerous writings attributed to Hippocrates, very few are now recognised as genuine: and even these have not been transmitted to us free from interpolations and other changes in the connection and arrangement of the materials, which his transcribers, commentators, and followers, have, from various motives, been induced to make. Such of them, however, as are least disfigured by these corruptions, are distinguished by a remarkable conciseness, and, as it were, compression of style, which at times, indeed, borders upon obscurity. Upon this characteristic, and upon his use of the most common and familiar terms,

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in preference to far-fetched expressions, the most acute commentators of his works, and especially Galen, who from the time in which he lived, and his intimate knowledge of the Greek tongue, may be supposed to have been very competent to the task of deciding upon their merits, have rested the proofs of their authenticity.

Of the works regarded as spurious, some appear to have been the composition of different individuals of the same name, either ancestors or successors of Hippocrates the son of Heraclides, and to have been erroneously ascribed, from the ignorance of his annotators, or the vanity of his adherents, to one and the same individual. Thus the treatises *Περὶ ἀγνῶστων*, and *Περὶ ἀεθροῦ*, are supposed to have been written by Hippocrates, the son of Gnosidicus, and father of Heraclides; while Hippocrates III. and IV. grandsons of Hippocrates II. are the reputed authors of several of the Books of *Epidemics*, &c. The rest, from the style in which they are written, from the mention of opinions which were not current in Hippocrates' time, or of facts and discoveries which bear a much later date, are all rejected as supposititious.

I shall, in this place, content myself with mentioning briefly the works generally esteemed original, and those which M. Cabanis has given as such, but which there is reason to believe to be spurious. In this account I shall principally follow Ackermann, to whose learned critique the reader is referred for more ample details.

1. The First and Third Books of *Epidemics* are universally acknowledged as the composition of Hippocrates.
2. The Book on *Prognostics* has all the characters of authenticity.
3. The First and Second Books of *Predictions* are also by Hippocrates, but with the interpolations of others.
4. The Books of *Aphorisms*,
5. The

5. The Treatise *On the Diet in Acute Diseases*,
6. The Essay *On Air, Waters, and Soils*, and
7. The Treatise *On the Wounds of the Head*, are allowed to be genuine.

On the contrary, among the works particularized by M. Cabanis, the Anatomical treatises, the remaining Books of *Epidemics*, the general discourses on the study of medicine, and the Letters, are accounted supposititious. The Treatise *Περὶ καρδίας*, which is praised in a subsequent part of the work for its accuracy, is mentioned neither by Erotianus nor Galen. Besides, it takes notice of the discovery of the *valves* of the heart, which is universally attributed to Erasistratus.—The Essay *Περὶ ἀρχαίων ἰατρικῆς* is mentioned by Erotianus, but passed over in silence by Galen, and by the generality of critics is regarded as spurious. Haller, indeed, has shewn, that it was not written till after the time of Aristotle. The Essay *Περὶ τέχνης*, which is also commended by our Author, is noticed by Erotianus, and ascribed by Suidas to Hippocrates, the son of Gnosidicus, but is not reputed original. Lastly, the Letters of Hippocrates, as we have already observed, are all believed to be fictitious. “De Epistolis Hippocratis quod ex me quæris,” says Scaliger in a letter to Vorſius, “antiquas eas esse scio, ut Democriti, Solonis, Pittaci Mitilenæi, quæ apud Laertium leguntur. Sed quia omnes illas, quæ illis philosophis a Laertio attribuuntur, multis argumentis confictas a Græcis, quibus nunquam mentiendi voluntas aut facultas defuit, probare possum; ideo cur et de his Hippocratis dubitem justissima causa est. Et certe, si animi nervos intendere velim, facile non esse Hippocratis vincam, Unicuique judicium suum relinquimus; tutius tamen est de eo dubitare, quod facilius est confutare, quam asserere.” JOSEPH. SCAL. *Epist.* CCCVI. The letter, mentioned

in the text, in which Hippocrates is invited by the Abderites to visit Democritus, has been shewn by Reland to be the composition of Epictetus.

NOTE [F], page 108.

THE first description of the Small-pox was given, not by Rhazes, but by *Ahrun*, an Arabian physician, the cotemporary of Paulus Ægineta, who lived nearly 300 years before the time of Rhazes. His work, consisting of thirty books, to which he gave the name of Pandects, is the most ancient of all the medical writings of the Arabians. But although it was translated into Syriac by one or more persons, it is no longer in existence. Numerous extracts from it, however, have been preserved by Rhazes, and, among others, his description of the small-pox, which he supposes to proceed from a corrupt state of the fluids, and the effervescence of the blood with the bile, “*ex malo sanguine adusto cum colera.*” His prognosis is better than his method of cure, which is inert and not very judicious. In the commencement of the disease, he orders the patient to be kept warm, lest the eruption should be repelled, and prescribes the use of demulcent drinks and gargles. When the eruption has run its course, he gives the following directions: “*Cum sint digestæ (variolæ), jaceat patiens super farina rizi, et fumigetur cum foliis myrti et olivarum, et desiccabuntur.*” *RHAZES Continent. lib. XXX. (Ed. Surian.) fol. 422. Venet. 1542.*

NOTE [G], page 128.

THE origin of the Venereal Disease, notwithstanding the many laborious researches which have been instituted with
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a view to ascertain it, still remains involved in obscurity. The idea most generally received in this country, that it was brought into Europe by the discoverers of the New World, is far from being proved by satisfactory evidence, though it has been adopted by some of our best and most accurate historians. Sprengel, in the Second Volume of his *History of Medicine*, has entered into an examination of the various opinions that have been maintained on the subject, and endeavoured to determine their respective merits. As the dissertation to which I allude gives a clear and distinct statement of the question, and is much more complete, than any thing which it is in my power to furnish, I shall here give an abstract of it, regretting, that my limits prevent me from translating it at full length.

1. THE assertion, that Siphylis was introduced into Europe, from America, is not confirmed by competent testimony. The first writer who countenanced this opinion, appears to have been one Leonard Schmaufs, a physician of Strasburg, whose works were published in the year 1518. His evidence, however, cannot be considered as by any means decisive of the point in dispute, since his proofs rest chiefly on the illusory notion, that in those countries, where endemical disorders prevail, Nature has always provided the means of their cure. Thus, the West Indies produce the Guaiac; consequently, the Venereal disease must have originated there. The same argument is used by Guicciardini and numberless other authors. Nor can much stress be laid on the appeals to the testimony of the first discoverers of the New World, as from the narratives of the historians of their expeditions, we are not entitled to infer, that the Venereal disease was known to the Americans, before their intercourse with the inhabitants of Europe. Only it appears, that in some of the West Indian Islands, there prevailed

prevailed a disorder, termed by the natives *Caracaracol*, resembling the itch, and supposed to proceed from great acrimony of the fluids. Gonçalo Hernandez de Oviedo, who had been *Adelantado*, or Governor, in Darien and St. Domingo, affirms, in the most positive manner, that the Venereal disease was imported from America by the Spaniards, and by them communicated to the Neapolitans, at the time of the expedition of Gonçalvo de Cordova. But the account given us of the character of Oviedo, by the most impartial and authentic historians, as Herrera, Ferdinand Columbus, Las Casas, and others, naturally leads us to view his asseverations with mistrust. Governing the Americans, whom fortune had subjected to his power, with the greatest cruelty and oppression, he endeavoured to exculpate his conduct by shewing, that that unhappy people deserved no better treatment; and he left no means untried to inspire the Emperor Charles V. with the belief, that the West Indians were the most vicious and incorrigible race of men, and ought to be wholly exterminated from the face of the earth. The later writers on the subject seem to have borrowed their proofs from the above-mentioned sources.

2. It is extremely improbable, that the Venereal disease should have originated among a people, whose manners were so simple, and who could not, without great injustice, be accused of those vices which are introduced only by luxury. That a peculiar species of leprosy was prevalent among them, appears from the testimony of several travellers of undoubted veracity: but its identity with siphylis is by no means established. It is, also, worthy of remark, that, in the Island of Hispaniola, the ancient names of the latter bore no resemblance to that of this endemical disorder, the *Caracaracol*, it being there termed *Guaynara*, *Hipa*, *Tay-ba*, or *Yça*.

3. Towards

3. Towards the end of the fifteenth century, the local symptoms of syphilis appear to have increased in variety and frequency, in proportion as leprosy affections became less common. From a very remarkable passage in Windeck's *Chronicle*, it may be inferred, that, so early as the year 1414, King Ladislaus of Naples fell a victim to this disorder.

4. The true Venereal disease, however, made its appearance, in the summer of the year 1493, almost at the same time throughout the greater part of Europe. On the 4th of March, 1493, Columbus, on his return from his first expedition, landed at Lisbon. On the 13th of the same month he arrived in the port of Palos, and about the beginning of April he reached Seville. Now, in the commencement of the summer of 1493, the Venereal disease had already shewn itself in Auvergne, in Lombardy and other parts of Italy: and, in the course of the same summer, it was observed at Halle in Saxony, in the Dutchy of Brandenburg, at Brunswick, and at Mecklenburg. Thus, we see how little confidence is to be placed in the accounts of its introduction from America by the Spaniards, and consequent diffusion through Europe; and how contradictory to fact is the relation of Oviedo, who affirms, that the disease was first brought into Italy, by Cordova's fleet, which did not arrive at Messina till the 24th of May, 1495. The troops of this expedition could no longer have any communication with Charles the Eighth's army; and yet it is known, that on the return of the latter to France, the Venereal disease, which had already existed for about two years, extended its ravages very widely.

5. Nor can the expulsion of the Jews, or *Marranos*, as they were called, from Spain, afford a satisfactory explanation of the sudden and extensive diffusion of syphilis. About the year 1487, a number of these unfortunate men took

took refuge in Italy, in order to save themselves from the implacable fury of the Inquisition, whose rage had been exasperated by an insurrection at Saragossa, in which one of the Inquisitors lost his life. But in 1492, an edict was issued, at the instigation of the Grand Inquisitor, Torquemada, by which all the Jews in Spain were ordered to quit the royal dominions, within the space of four months, and at the same time prohibited from taking any money or other valuables along with them. In consequence of this decree, about 170,000 families, or 800,000 persons, were banished from the kingdom, a considerable number of whom were conveyed, at the public expence, from Andalusia, to different parts of Africa, France, Italy, and Greece. Of these, many contrived to gain admittance into Rome, where, notwithstanding the urgent representations of the Spanish Ambassador, they were allowed to remain after receiving the papal absolution. In the month of July, 1493, the plague broke forth at Rome, and is said by Infessura to have proceeded from the Jews. They were also accused of having introduced a contagious disorder, which, some weeks afterwards, prevailed at Naples, and by which upwards of 20,000 persons were carried off in the city of Naples alone. From the concurrent testimony of different authors, it appears, that the *Marranos* were much given to debauchery, that leprous disorders were very common among them, and that an immense number of them died of the plague on their passage from Spain: and it is even asserted by some, that the Venereal disease first appeared among them. But these accusations must be in part ascribed to the national hatred with which they were so long pursued. At all events, there is no certain evidence of the disorder having thus originated.

6. At first, the Venereal disease seems to have been very similar in its nature to leprosy and other impetiginous disorders,

orders, attacking chiefly the skin, and producing malignant scabious eruptions. Hence, before the time of Leonicensus, it was very generally believed to be a variety of elephantiasis, or yaws, and was called *Formica*, *Morphea*, &c. In the beginning of the sixteenth century, siphylis lost its leprous character; the symptom of gonorrhœa supervened; and it gradually assumed its present form.

7. That the disease was originally of a pestilent nature, and attacked a far greater number of persons, than could well be supposed to have received it from simple infection, may be inferred from the ideas which prevailed with respect to its origin. Thus, it was attributed to the malignant influence of the stars, particularly of Saturn, the Devourer of children, in his various conjunctions and oppositions. Leonicensus derives it from the general inundations that occurred in the years 1493 and 1528. In fine, the symptoms of siphylis were by many supposed to proceed, from acrimonies of the fluids, the deposition of a bilious matter in particular parts of the body, &c.

8. These ideas served to suggest the method of cure. At first, correctives of the blood, evacuant medicines, venesection, and other similar means, were employed. So early as the year 1497, mercury was exhibited externally in siphylis, but was not very freely used. About the year 1517, guaiac was recommended as a specific for this disorder, and supplanted the use of mercury, till Paracelsus again introduced the latter, and demonstrated its superior efficacy. SPRENGEL *Geschichte der Arzneykunde* (2te Aufg.) II Th. p. 646—662.

NOTE [H], page 130.

It seems a remarkable circumstance, that, although the surgeons, here designated by the title of the Four Masters, had

had acquired great repute in their life-time, and had composed conjointly a treatise on Surgery, which is frequently cited by Chauliac; yet few particulars are known respecting them, and their names are buried in oblivion. The following relation is extracted from the *Index Funereus Chirurgorum Parisiensium* by M. de Vaux.

“ Eodem tempore (circa annum 1310) florebant Parisiis quatuor insignes Chirurghi, sub eodem tecto solitarie degentes, et a contemporaneis scriptoribus sub nomine Quatuor Magistrorum designati; sed eorum nomina ad nos usque non pervenerunt.”

“ Scitur tantummodo, veteri traditione, viros fuisse doctri-
trina et pietate spectabiles, qui sese invicem, meræ sub
charitatis vinculo, pauperum vulneratorum et infirmorum
chirurgicæ tractationi alligaverant, et de universa chirurgia tractatum secundum Empiricam methodum conjunctim scripserant, a Chauliaco laudatum, cujus manuscriptum exemplar, sed valde lacerum, et tinea pene exesum, paucis abhinc annis in Bibliotheca Regiæ Navarra visebatur.”

As the work of Guy de Chauliac is scarce, and, I believe, little known in this country, I shall subjoin the account which he gives of the principal sects of surgeons in his time, as quoted by Quesnay.

“ La premiere Secte fut de quatre Maîtres, de Roger et de Roland, qui indifféremment a toutes playes et aposthemes procuroient sanie, suppuration avec leurs bouillies et paparots, se fondant sur cela du cinquième des aphorismes, *Les laxes sont bons, et les crus mauvais.*”

“ La seconde fut de Brunus et de Theodoric, qui indifféremment desséchoient toutes playes avec du vin seul, se fondant sur cela du quatrième de la Thérapeutique; *Le sec approche plus du sain, l'humide du non sain.*”

“ La troisième Secte fut de Guillaume de Salicet, et de
 “ Lanfranc, qui voulant tenir le milieu entre eux, y procu-
 “ roient ou pansoient toute playes avec onguent, et emplâtres
 “ douces, se fondant sur cela du quatorzième de la Théra-
 “ peutique; *que la curation a un moyen qui soit traitée*
 “ *sans fraude et sans douleur.*”

“ La quatrième Secte est de tous les Gend’armes, ou
 “ Chevaliers Teutoniques, et autres suivans la guerre; les-
 “ quels avec conjurations et breuvages, choux, huile, laine
 “ pansent toutes playes, se foudant sur cela; *que Dieu a mis*
 “ *sa vertu aux paroles, aux prières, et aux herbes.*” See
Recherches sur l’Origine et sur les Progrès de la Chirurgie
en France, p. 60-3, 4to.—Paris, 1744.

NOTE [I], page 176.

ALTHOUGH I am very ready to admit, that Hobbes, Locke, and Condillac, may, in certain points of view, be regarded as successful followers of the Inductive path of research, it appears to me doubtful how far the unqualified assertion, that they have all “*improved upon the views of Bacon,*” is consistent with the truth. Hobbes, in particular, who, in his youth, is known to have lived on terms of intimacy with Bacon, was so far from recommending the experimental method of investigation, which the latter had strenuously inculcated, that, whether from a belief of its inadequacy to the end proposed, or from some more ignoble motive, he used no small pains to bring it into disrepute, insinuating, that the study of the spontaneous operations of Nature was alone sufficient for the construction of a true system of physics. In his *Dialogus Physicus de Natura Aëris*, written with a view to controvert Mr. Boyle’s opinions respecting the pressure and elasticity of the atmosphere, and published in the year 1661, he ridicules the Members of the Royal Society for their attention to experi-
 ments,

ments, and affirms, that the most illiterate mechanics were equally entitled to the appellation of *philosophers*, and that the only difference between the two was, that the latter confessed their ignorance, but the former would not confess theirs. All the errors, however, into which they had fallen, are discovered by him to proceed from their rejection of his hypothesis of Circular Motion; “*sine qua hypothesi,*” he tells them, “*quantuscunque labor, ars, sumptus, ad rerum naturalium invisibiles causas inveniendas adhibetur, frustra erit.*” p. 8. In another part of his Dialogue, he triumphantly asks; “*Quorsum tantus apparatus et sumptus Machinarum factu difficilium, ut eatenus tantum prodiretis quantum ante prodierat Hobbius? Cur non inde potius incepistis ubi ille desit? Cur Principiis ab eo positis non estis usi? —Ad causas autem propter quas proficere ne paululum quidem potuistis, nec poteritis, accedunt etiam aliæ; ut odium Hobbi, quia nimium libere scripserat de Academiis veritatem. Nam ex eo tempore irati physici et mathematici veritatem ab eo venientem non recepturos se palam professi sunt. — Et quod paucissimi sunt eorum qui scientias profitentur, qui veritates difficiles ab aliis quam a se inventas esse, non doleant.*” p. 23.

At the same time I am aware, that many passages may be quoted from Hobbes’ works, in which doctrines of a very different tendency are maintained and exemplified. But it will be difficult to find an excuse for the arrogance, petulance, and illiberality, of the above and other similar remarks; especially, if we consider, that they were adduced in support of a vague hypothesis, which was in contradiction to facts, and which had been already disproved by the most striking and conclusive experiments,—the experiments of Torricelli, of Pascal, and of Boyle!

NOTE [K], page 278.

AS affording an example of the successful application of the Analytical Method to the study of Medicine, I beg leave to refer the reader to Dr. Darwin's account of the Diseases of Association, and particularly to his Theory of Fever. It is not as explaining the phenomena of the febrile state upon any particular hypothesis, that this theory ought to be considered; but as presenting a clear and systematic exposition of the principal symptoms, in which their development is traced, and their mutual connection determined. Viewed in this light, it bids fair to become, one day, the foundation of a system, "which," as the author has with just confidence expressed himself, "may not moulder, like the structures already erected, into the sand of which they were composed; but which may stand unimpaired, like the Newtonian Philosophy, a rock amid the waste of ages!"—At the same time it must be acknowledged, that his explications are far from complete; that they contain some inconsistencies, and may admit of many important corrections and improvements. But abstracting from these considerations, they will be found, I believe, to exhibit the most beautiful specimen of *induction* which the science of medicine can boast, and ought certainly to be sufficient to rescue the fame of the author from that oblivion which seems to threaten his other theoretical writings.

THE END.

